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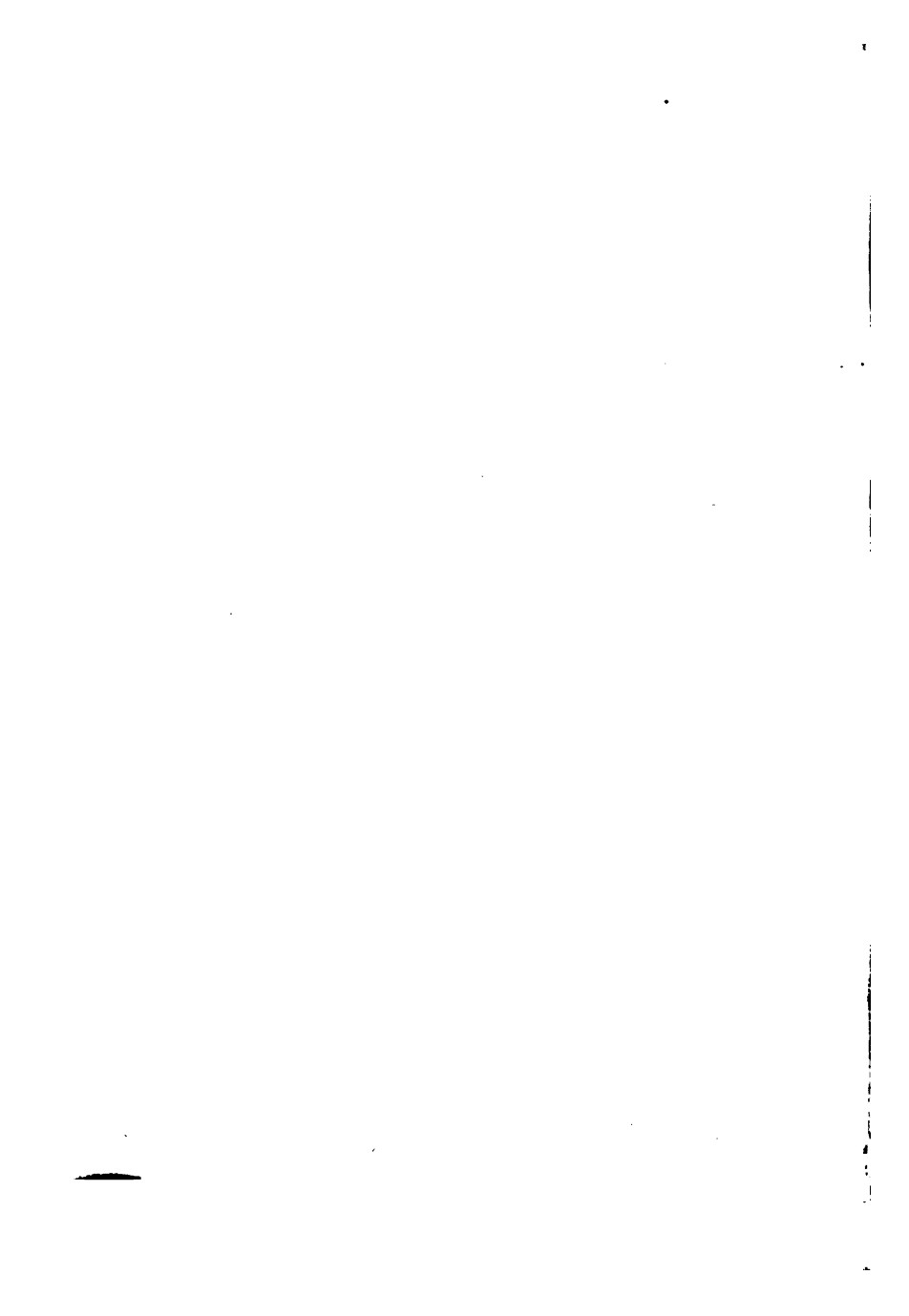
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PREFACE

IN this Series I have tried to embody the experience of a teacher and of an examiner. For twelve years I have been teaching Geography constantly to classes of all sizes and all ages, the average number of pupils coming to me in the course of any one day being at present about 200; and during the last five years I have examined more than 25,000 candidates in the subject.

This experience has led me to several conclusions, which will, I believe, be confirmed by most practical teachers who are interested in Geography as a subject of real educational value:—

1. That the maps which are so lavishly supplied in modern text-books, cannot generally be used directly with the text, as it is impracticable to have the book open in more than one place at a time; but that their presence in the book has led to a regrettable neglect of the Atlas.
2. That an excessive variety of type and other mechanical devices for classification are apt to confuse the average pupil.
3. That most text-books contain much which would be better learned from the Atlas, or which is only an unnecessary tax on the memory.

Consequently, this Series contains no maps and little variety of type; and I have intentionally avoided

mentioning, *e.g.* exact heights, distances or sizes, small industries, and unimportant places. Wherever any definite comparisons are made, they are intended only for reference, and not to be learnt; but, of course, in teaching I do use exact standards—taken from our own locality, and therefore not equally useful elsewhere—*e.g.* Greenock, Bute, and Ben Lomond. Practically every one of us has seen them, and they are very easy to grasp at a single glance, to inspect in a single walk, and to apply both inside and outside Scotland.

I hope, too, that the book has more than these negative merits. I have had the privilege during the last five years of lecturing on the Teaching of Geography to a large number of practical teachers, including members of the Teachers' Guild, of the National Schoolmasters' Holiday Course, and the Teachers' Section of the Oxford Summer Meeting. This book is written exactly on the lines of these lectures, and embodies the criticisms and suggestions of these professional audiences.

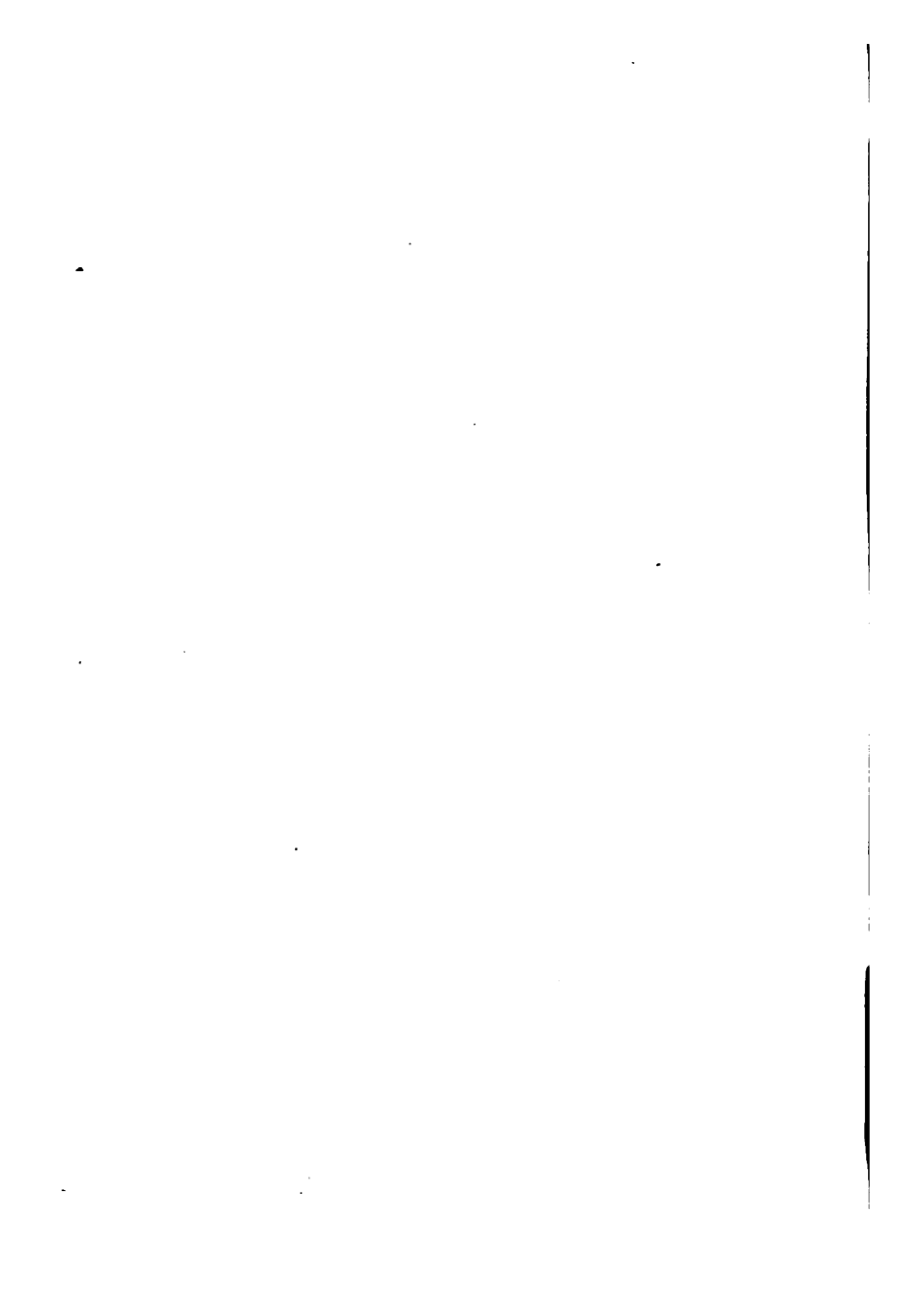
As our knowledge of Africa is largely limited to its general features, emphasis has been laid on these rather than on particular details; and comparisons between the size of African and British cities have been avoided, as the conditions of native life make them only misleading.

I have to thank Mr. A. J. Herbertson for much kind help in revising the proof-sheets.

L. W. L.

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AFRICA.

Lesson 1. Introductory.

1. Africa is part of the "Old World," and was the scene of some of the earliest civilisations; but it has been so little known until within the last twenty years that it is appropriately called "The Dark Continent."

- (1) Its geographical conditions have been a tremendous obstacle to its exploration.
- (2) All its natives are more or less dark-skinned, and it is the home of the Black Man.
- (3) It is shrouded in moral darkness; for it is the land of the slave-dealer, the fetich, and the human sacrifice.

2. Many of the chief features of the continent were known to Ptolemy (A.D. 150) and even to Herodotus (B.C. 450), and the Portuguese pioneers paved the way for further knowledge by their discovery and partial settlement of the Cape at the end of the fifteenth century.

- (1) Bartholomew Diaz discovered the Cape of Good Hope—or Cape of Storms, as he called it—in 1487, and Vasco de Gama discovered the Cape route to India in 1497. Cf. p. 6.

N.B.—The number of islands and bays called after saints is due to the good old custom of giving to places the names of the saints on whose festivals they were discovered. Cf. the coast of South America.

3. The scientific exploration was begun by Bruce towards the end of the eighteenth century by his famous expedition to the sources of the Blue Nile, and falls roughly into three epochs—

- (1) The Niger problem, with which are associated the names of Mungo Park and Clapperton (1778-1830);
- (2) The Nile and Zambesi problems, associated specially with the names of Livingstone, Burton, Speke, and Baker (1850-1862);
- (3) The Congo problem, solved by Stanley in a single journey (1874-77).

N.B.—The northern and southern portions of Equatorial Africa became connected with each other through (2), and the eastern and western portions through (3).

SURROUNDINGS.

Lesson 2. General Surroundings.

1. Africa is surrounded by sea everywhere, which ought to have a very beneficial effect on its climate, commerce, and defence.

- (1) It ought to make the climate more moist, and therefore more even, than it would otherwise be ; but much will depend on the character of the surrounding sea, the direction of the prevailing winds, and the size and position of any mountains.
- (2) It ought to tempt the inhabitants into various sea industries, such as lead on to ocean traffic.
- (3) It ought to protect them from the wars and pestilences of other continents.

2. Africa has, however, less benefit from its surroundings than any other continent on the face of the earth.

- (1) Its coast has very few commercial advantages.
- (2) The Red Sea is very narrow, and has little or no effect on the climate.
- (3) The latitude largely counteracts the few advantages which do exist.

3. Africa has less coast-line in proportion to its size than any other continent.

- (1) For instance, North America has twice, and Europe has three times, as much in proportion to their size. Indeed, Europe has actually some 3000 miles more coast than Africa, though the latter is three times as large as the former.

4. The reason for this is the extraordinary simplicity of its outline, which entirely prevents the interior of the continent from enjoying either the commercial or the climatic advantages of the sea.

- (1) The double Sidra-Gabes and Benin-Biafra gulfs are really not exceptions to this, nor are the isolated inlets such as Delagoa Bay, Walvisch Bay, and False Bay.
- (2) The Sidra-Gabes recess, the ancient Syrtes or quicksands, has almost no value for commerce, and is backed by the Sahara.
- (3) The division of the Gulf of Guinea into two is merely a nominal division caused by the protrusion of the Niger Delta.

5. The want of bays, gulfs, and inland seas, is not the only disadvantage of the coast; disease and deserts are still more formidable.

- (1) For hundreds of miles along the west coast north of Cape Blanco, and along the east coast between Cape Guardafui and Suez, the shore breaks immediately on to desert.
- (2) For hundreds of miles along the west coast between Cape Verde and Cape Frio, and along the east coast north of Cape Corientes, the flat marshy shore is a hot-bed of disease and death.
- (3) Where climate and coast are most favourable, as in the extreme south-west and the extreme north-west, communication inland is seriously hampered by mountains, *e.g.* the Atlas.
- (4) At the other two points where Africa comes nearest to its neighbours, the Isthmus of Suez and the Bab-el-Mandeb Straits, it faces only desert.
- (5) These two points, however, like the Straits of Gibraltar, mark the natural connection of Africa with the Old

World; for, while the Mediterranean and the Red Sea are comparatively shallow and narrow, broad and deep oceans wash Africa everywhere else.

N.B.—The Straits of Gibraltar are 8 miles wide, and the Bab-el-Mandeb are 20 miles.

6. The coast of Africa is also remarkably deficient in islands; and those which really belong to the continent are of little value.

- (1) The only large island is Madagascar, which is separated from the mainland by the 250 miles of the deep Mozambique Channel.
- (2) The small islands, almost all of which are of volcanic origin, are either in groups—the Canary, Cape Verde, and Comoro Islands—or isolated, like Ascension, St. Helena, and Sokotra.
- (3) There are a number of islets along the coast of the Red Sea; but the only important African islands that are really continental are Sokotra, Fernando Po, and Zanzibar. The distance from the mainland and the depth of the intervening sea make even the Canaries really oceanic islands, and the Azores and Mascarenhas have practically nothing to do with Africa at all.

N.B.—These outlying islands were, however, of very great use to the early explorers as bases of operations.

7. Again, the winds and currents are not very favourable; the most regular winds blow on the Atlantic over a cold current and away from land, while the winds that blow landward over warm currents (especially the Mozambique current) are the least regular.

- (1) Off the west coast there is the cold Benguela current, and the westward course of the Trades carries them seaward towards the Equator; but, even if they blew shoreward, they would carry very little moisture off the cold current.

- (2) Off the east coast both the northward and the southward currents are warm, and the westward course of the Trades does carry them shoreward; but the S.E. Trades are terribly checked by the great height and length of the Madagascar Mountains, and the N.E. Trades blow for only half the year.
- (3) In summer the intense heat of the Sahara draws the 'Etesian' winds inland from the Mediterranean, and S.W. monsoons inland from the Gulf of Guinea; but the Mediterranean is too narrow to saturate any winds that pass over it, and the monsoons blow off the cold Benguela current.

N.B.—It is the meeting of this cold current with the warm Agulhas current that causes the frequent fogs and storms off the Cape of Good Hope, which was originally called the Cape of Storms.

SURFACE.

Lesson 3. General Surface.

1. Africa is an enormous plateau divided into two parts by the Equator, very much as India is divided by the Tropic of Cancer.

- (1) As in India, the shape of the country makes the northern half larger than the southern.
- (2) As in India, too, the northern half is an oblong running east and west, and the southern half is a triangle running north and south.
- (3) As in India, again, the northern or continental half is lower, drier, and hotter than the southern or peninsular half.

2. Not only is the whole continent an enormous plateau, but it is essentially a continent of plateaus.

- (1) There are no huge low plains or high mountain ranges like those of Asia and America, but the whole mass has a more or less uniformly high level, rising suddenly from the coast in terraces to a saucer-shaped depression inland.
- (2) The plateaus are higher in the east than in the west, reaching in Kilima Njaro and Kenia a height of 18,000 to 19,000 feet, *i.e.* half a dozen times as high as Helvellyn or Ben Lomond.
- (3) This eastern ridge of the plateau consists mainly of very old rock, and may be called the backbone of the continent.

3. As has been said, the north is lower, drier, and hotter than the south.

- (1) The isolated Atlas Mountains in the north-west rise to a height of 12,000 to 14,000 feet, i.e. four times as high as Helvellyn or Ben Lomond ; but elsewhere the plateau level is broken only by a few comparatively low ranges running across it from the south.
- (2) The most important of these low ranges are the Tibesti, which runs up to the oasis of Ghat—the ranges which skirt the Red Sea—and those which shut in the two banks of the Niger.
- (3) Shut in between the Atlas and these spurs from the southern plateau is the huge Sahara Desert, which is very nearly as large as Europe ; and in the south between the two central spurs, where the desert merges in the narrower and better-watered peninsula, there is the inland basin of Lake Chad.

4. The longest slope of the southern half, like that of the northern, is from the south-east down to the north-west ; but such a huge mass can hardly be expected to have a single general slope.

- (1) The Kamerun, like the Atlas, is an isolated height in the north-west.
- (2) The Zambesi, like the Niger, empties towards the south-east.
- (3) The water-parting between the Congo and the Zambesi is as vague as that between the Nile and the Shari.

5. The eastern portion of the peninsula is, however, distinctly the higher, and has a very marked character.

- (1) Its highest ridge runs almost due north and south, following a line of volcanoes, extinct and active, the chief peaks of which are those of Kilima Njaro and Kenia ; and there is a similar ridge farther west, the highest peak of which is Ruwenzori (16,700 feet).

- (2) Between each ridge and the general surface of the intervening plateau there is a corresponding line of deep valley, which is even continued beyond the Red Sea in the Gulf of Akaba and the Jordan valley.
- (3) The whole area between the ridges is full of lakes, some of which are broad, like the Sea of Galilee, *e.g.* Victoria Nyanza and Lake Tsana, while others are long and narrow, like the Dead Sea, *e.g.* Lake Nyasa and Lake Tanganyika.

6. The western half of the peninsula is almost entirely occupied by the huge basin of the Congo.

- (1) This basin, like that of Lake Chad, is one of the typical saucer-shaped depressions of Africa ; and it is enclosed almost everywhere by the typical plateau rim.
- (2) The basin extends on both sides of the Equator, and owes its volume of water partly to the narrowness of the peninsula in the latitude of Zanzibar, *i.e.* the point to which the N.E. Trades reach in winter. Cf. p. 18.
- (3) From the southern limit of the basin the plateau-level extends practically to the south of the continent.

7. The presence of mountains on or near the edge of the plateau has greatly affected both climate and inland communication.

- (1) All the rivers are spoilt by cataracts, many also by steep banks.
- (2) All the mountains have comparatively heavy rainfall on their seaward slopes, and prevent rain from being carried inland.
- (3) The difficulties of river navigation increase the need for railways, to the construction of which the mountain rim is a great obstacle.

N.B.—The coastal strip is very seldom more than 300 miles in width, and generally very much less,

Lesson 4. Mountains (1).

1. There are three distinct mountain systems in Africa—the East Coast, the West Coast, and the Atlas.

- (1) Like the mountains of Australia, they all run along the coast.
- (2) Like the Australian mountains, too, they rise abruptly from the coast and break off inland on to great plateaus.
- (3) And like the Australian mountains, again, but unlike the mountains of the rest of the Old World, they run north and south, not east and west.

2. The Atlas Mountains fill up the whole of North-west Africa between the ocean and the desert, from the mouth of the Draa to Cape Bon.

- (1) Like the other African systems, the Atlas rises abruptly from the sea, and sinks gradually inland—to the plateau of the Sahara.
- (2) Like the East Equatorial Range, it runs in parallel lines with lakes between.
- (3) There are, however, some marked differences between its western and eastern portions.

3. The western portion, which is generally known as the Great Atlas, is confined to Marocco, and is a real mountain range.

- (1) It is much the highest part of the whole system, having for a considerable distance a height of from 10,000 to 13,000 feet. Cf. p. 16, *N.B.*
- (2) The highest peaks, Aiashi and Tamjurt, are probably over 14,000 feet, *i.e.* four times as high as Snowdon.

- (3) It is thus a great obstacle to the passage of wet winds inland ; and such winds as do penetrate through the lower passes, *e.g.* the Telremt (about 7000 feet high), have still to face the parallel chain of the Anti-Atlas.

4. The eastern portion, which extends through Algeria and Tunis, is really a plateau with high buttresses along its northern and southern edges.

- (1) The northern buttress, or Maritime Atlas, is sometimes included in the 'Tell' of Algeria, and is crossed by some fertile valleys ; it varies in height from about 7500 feet in the west, *e.g.* the Jurjura peaks, to 6000 in the east, *e.g.* the Setif peaks.
- (2) The Halfa Steppe, or plateau between the two buttresses, is covered with salt lakes called Shotts ; and similar lakes occur again on the landward side of the southern buttress, or Saharan Atlas, which is even higher than the northern one.
- (3) In Tunis the plateau gradually sinks eastward until only the two buttresses remain in the capes of Blanco and Bon.

5. The West Coast Range consists of three detached and discontinuous sections—the Southern, the Central, and the Northern.

- (1) The Northern section consists of the Futa-Jallon Highlands, which are simply the steep face or buttress of the plateau—so steep that from the sea they have the appearance of a mountain range, though they are no higher than Ben Nevis.
- (2) The Southern section consists of the Lower Guinea Highlands, of which the Serra do Crystal is the most marked ; and these, like the Northern, are simply the steep outer edge or escarpment of the plateau, though they are a little higher than the Northern.

- (3) Mount Kamerun is an isolated peak, 13,000 feet high, and belongs to a volcanic chain, the other summits of which appear as islands, *e.g.* Fernando Po, Prince's Island, St. Thomas.

Lesson 5. Mountains (2).

1. The East Coast Range is by far the most important; it consists, like the West Coast Range, of three detached and discontinuous sections—the Southern, the Central, and the Northern.

- (1) The Southern section runs from Cape Town to the Limpopo under various names, *e.g.* Nieuw-veld, Sneeuw-Berge, Storm-Berge, Draken-Berge; and it varies in height from about 6000 feet in the Nieuw-veld to nearly 8000 feet in the Sneeuw-Berge (Compass Berg = 7800), and about 11,000 feet in the Draken-Berge (Mont aux Sources, 11,150 feet).
- (2) The Central section consists of the eastern buttresses of the East Equatorial plateau, and its characteristic feature is the series of huge volcanic peaks which overlook the Great Lakes at a height of 16,000 to 19,000 feet, *e.g.* Ruwenzori, Kilima Njaro, and Kenia.
- (3) The Northern or Abyssinian section has no peaks above 15,000 feet, but no other equal area in Africa has such a great average height as Abyssinia.

2. The longest and most important part of the Southern system is the Draken-Berge, which cuts off from the sea the great pastoral plateau of the Dutch Republics; but the broadest part is the triple range which runs through Cape Colony, and contains the pastoral plateau of the Great Karroo.

- (1) The whole system rises abruptly from the coast, and sinks gradually inland; and the height of the moun-

tains and their nearness to the sea cause the precipitation of rain to be very sudden and violent on the seaward slopes.

- (2) Consequently, the seaward rivers, *e.g.* the Tugela and the Gamtoos, compared with the inland rivers, *e.g.* the Orange and the Vaal, are short and rapid and subject to sudden and dangerous floods ; and the most important of each class, the Orange and the Tugela, rise on opposite sides of the crest of the system in Mount aux Sources and Mount Cathkin.
- (3) As the system is not strictly continuous, the gaps have been extremely useful for communication inland. For instance, the main line of rail from Cape Town to Kimberley and Bulawayo creeps between the Nieuw-veld and the Sneeuw-Berge ; that from Durban and Pietermaritzburg to Pretoria creeps between the Draken-Berge proper and the Rand-Berge.

3. The Central or East Equatorial section contains the highest peaks on the continent and nearly all the Great Lakes, and consists mainly of two parallel lines of volcanic heights and lake-filled valleys.

- (1) It stretches from the Zambesi to the borders of Abyssinia, and is in the shape of a catapult ; the handle is the Livingstone Mountains, the right fork extends along the line of Kilima Njaro and Kenia, and the left fork along the line of Mfumbiro and Ruwenzori.
- (2) On the east side the system rises in abrupt terraces from the coastal plain, only to fall abruptly into the deep trough marked by the long narrow lakes of Eyassi, Baringo, and Rudolf ; on the west side it rises much more gradually, but only again to fall abruptly into the deep trough marked by the long narrow lakes of Rukwa, Tanganyika, and Albert Nyanza.
- (3) Both troughs converge on the long narrow Nyasa, which lies parallel to the catapult-handle of the Livingstone

Mountains; and the character of the ground between them is marked by the broad Victoria Nyanza.

N.B.—*Nyanza* means 'water.'

4. The Abyssinian system, like the other two systems, rises abruptly from the coastal plain, and falls gradually inland.

- (1) The seaward face is in two terraces, the lower of which is simply the precipitous outer edge of the plateau—from 6000 to 8000 feet high.
- (2) From the plateau itself the two mountain groups of Simen and Gojam rise abruptly another 6000 feet, and overhang the broad shallow trough marked by Lake Tsana.
- (3) As the snow-line in the latitude of Abyssinia is only 13,000 feet, the chief peaks, *e.g.* Ras Dajan and Abba Yared, are quite high enough to have reservoirs of snow from which to feed the Atbara and Blue Nile for at least eight months in the year.

N.B.—The line of mountains is continued northward at a much lower height in the Coastal Range above the Red Sea.

RIVERS AND LAKES.

Lesson 6. Rivers (1).

1. The rivers of a continent have, of course, a very close connection with its mountain systems.

- (1) On the one hand, the distribution of the great land masses is practically the key to the watersheds of the continent.
- (2) On the other hand, the course of the rivers is practically the key to the general configuration of the land.

2. The African rivers fall into two classes—coastal and continental.

- (1) The coastal rivers are those that rise on the steep seaward slope of the huge plateau-formation of the continent ; and, as the slope is almost everywhere very near to the sea, they are generally too short and far too rapid for navigation.
- (2) The continental rivers are those that rise on the landward slope of the mountains which buttress the plateau ; and, as this slope is almost everywhere very slight, they are generally very much longer than the coastal rivers, and extremely valuable for navigation.
- (3) The nearness of their watershed to the sea causes the coastal rivers also to flood so suddenly and violently that they plough very deep channels, which greatly lessens their value for irrigation ; and the difficulty of cutting through the mountain rim to the sea causes the continental rivers to be terribly obstructed by falls and rapids.

3. The continental rivers may be subdivided into two further classes—oceanic and inland ; and this subdivision depends more or less upon the character of the watershed.

- (1) The western watershed has a very much heavier rainfall than any other part of the continent, and the eastern practically monopolises the 'perpetual snow'; while the centre of the continent has no snow and little rain.
- (2) The only important inland basin is that of Lake Chad; and, of the important oceanic rivers, the Niger and the Zambesi proper are entirely rain fed.
- (3) The difficulty of cutting through the mountainous rim of the plateau generally causes the oceanic rivers to make a very circuitous course, like the Niger, or to empty on the side of the continent opposite to their source, like the Zambesi, or to do both, like the Congo.

4. The whole river system can, therefore, be arranged under three oceanic and three inland drainage areas.

- (1) The oceanic areas take their names from the Atlantic, the Mediterranean, and the Indian Ocean, and the inland areas from the Sahara, the Kalahari Desert, and the Eastern Horn.
- (2) The three oceanic areas, as represented by the Nile, the Congo, and the Zambesi, all have their chief sources in the narrowest part of tropical Africa, i.e. the only part of the continent which has mountains over 15,000 feet high, and into which Trade Winds blow.

N.B.—A few lofty peaks are, however, less important than a general ridge elevation.

- (3) In Africa, as in Europe and the Americas, the Atlantic area is enormously the most important. Indeed, about half the land in the whole world drains into the Atlantic.

5. Not only is the Atlantic area by far the most important, but it also has very typical rivers of each kind. For instance:

- (1) Outside the Tropics in the extreme north, the Draa is a typical desert torrent, running dry except when the snows on the Atlas are melting.

- (2) Outside the Tropics in the extreme south, the Orange is a typical semi-desert river; and, like the Nile, it loses so much water by evaporation and absorption that it actually decreases in volume as it approaches the sea.
- (3) Between the Tropics there are hundreds of typical coastal rivers, especially along the Grain and Ivory coasts.
- (4) There are also, on the curious low plain of Senegambia, the only real lowland rivers of Africa, the Senegal and the Gambia.
- (5) And round the Gulf of Guinea there are several rivers which combine the features of both the coastal and the continental types, *e.g.* the Volta, the Ogowe, and the Kwanza,

Lesson 7. Rivers (2).

1. The four principal rivers of Africa are the Congo, the Nile, the Niger, and the Zambesi.

- (1) The Congo is the most important in every respect except length; and, in regard to the area of its basin and the volume of its water, it is surpassed by no other river in the world except the Amazon.
- (2) The Nile, with its 4000 miles, is 1000 miles longer than the Congo, and second only to the Mississippi-Missouri amongst the rivers of the world.
- (3) The Niger is nearly as long as the Congo, and comes next to it amongst African rivers for volume of water.
- (4) The Zambesi is only half the length of the Nile, but also ranks above it for volume.

2. The Congo, like the Amazon, has a large basin which includes an area of constant equatorial rainfall.

- (1) No other rivers in the world combine these two advantages.

- (2) In each case the great area of the basin gives room for a huge number of tributaries.
- (3) In each case, too, the constant heavy rainfall accounts for the enormous volume of water. Cf. p. 9.

3. The Congo basin contains a wide depression which stretches along the Equator for several hundred miles west of the Stanley Falls, and is encircled by a higher level of the great plateau.

- (1) This depression is the bed of an old lake or inland sea, the shores of which are represented by the rim of the plateau; and it was the tremendous weight of the water thus enclosed that enabled the 'Congo' to originally break through the rim on the west at its lowest point.
- (2) The rivers which originally fed this sea, now form a number of parallel tributaries of the Congo; and all of them are obstructed by falls and rapids where they tumble over the old shore-rim.
- (3) Thus the Kwango, Kassai, Lulua, Sankuru, and Lomami, all run northward parallel to each other, and all are obstructed by falls and rapids about latitude 5° S.

4. The Upper Congo is known by various names.

- (1) The main stream, under the name of Chambezi, rises south of Lake Tanganyika, and descends gradually to the south-west, but is diverted into Lake Bangweolo by the Lokinga Mountains.
- (2) Issuing from Lake Bangweolo as the Luapula, it turns due north, and passes through Lake Mwero to join the Lualaba.
- (3) Then it flows on north under the name of the Lualaba to the important Arab mart of Nyangwe, where at last it becomes the Congo.

5. The Middle Congo is a magnificent waterway of nearly 2000 miles in length between Nyangwe and Leopoldville.

- (1) Near Nyangwe it drops on to a great forest-clad plain, and at once broadens out to about a mile in width.
- (2) Just on the Equator navigation is completely stopped by the Stanley Falls, where the river again drops to a lower level.
- (3) From the Stanley Falls it makes a magnificent sweep westward to Stanley Pool, crossing the Equator again just above its confluence with its great northern tributary, the Mobangi.

6. Below Stanley Pool, in order to force its way to the sea, the Lower Congo has to compress itself into the winding channel of the Livingstone Rapids.

- (1) Ocean vessels can navigate the 100 miles up to Vivi, though most of them stop at Boma; and the 88 miles between Isangila and Manyanga are navigable.
- (2) The 50 miles from Vivi to Isangila is a series of boiling cataracts, and the same is true of the 85 miles from Manyanga to Leopoldville.
- (3) The force of the current may be estimated from the fact that the mud is carried out into the Atlantic for 300 miles.

7. The most important part of the whole river is the 1000 miles of unbroken navigation between Stanley Falls and Stanley Pool.

- (1) Between these two points the river broadens out from 15 to 20 miles in width, and is joined by at least twenty magnificent tributaries, including the Aruwimi from the dense forests below Mount Ruwenzori.
- (2) Consequently, about 7000 miles of waterway converge on Stanley Pool, giving access in various directions to an area a dozen times the size of Great Britain.
- (3) The whole of this enormous area is rich in palm oil, rubber, and ivory.

8. The Congo basin is practically confined to the Congo State, which is therefore a natural whole, but it has great facilities for trade beyond its own limits.

- (1) In the south, the Kassai, which is navigable for 1000 miles, gives easy access to the Zambesi. Indeed, Lake Dilolo sends streams into *both* rivers.
- (2) In the north, the Mobangi-Welle, which is navigable for 600 miles, gives easy access to the Nile and the Southern Sudan.
- (3) In the east, the Lukuga valley gives easy access to Lake Tanganyika, one of the great trade areas of the future.

Lesson 8. Rivers (3).

1. The Nile is the longest river in the Old World. Its history is fascinating, and it has immense political and commercial importance; but, simply as a river, it cannot compare with the Congo.

- (1) Egypt has been called 'the gift of the River,' and the name is significant of the part played by the Nile in the history of the country.
- (2) Politically, the Nile is the bond between Egypt and the Sudan, and its great eastward bend puts Berber into direct political relation to Suákin.
- (3) Commercially, it is the one highway northwards from the Equator to the Mediterranean; its current is always strong enough to carry a boat down stream, and from April to October the Etesian gales blow steadily up stream.

2. Like the Congo, the Nile has its source among the lakes of the eastern plateau, and has two great source streams.

- (1) The Victoria Nyanza is just under, and Lake Bangweolo is just over, 4000 feet above the sea.
- (2) The White or 'Clear' Nile, like the Lualaba, flows northward from its very source, and unites all its headwaters in Lake Albert, as the Lualaba does in Lake Lanji.
- (3) The Blue or 'Muddy' Nile, like the Luapula, is the eastern branch, and flows at first southward from Lake Tsana, as the Luapula does from Lake Bangweolo.

3. Like the Congo, too, the Nile is terribly spoilt by hostile climate and physical obstacles.

- (1) The climatic difficulty, however, is desert, not fever-haunted forest; and the obstacles are in the middle, not the lower, course.
- (2) For instance, in the 1500 miles between Alexandria and Berber, where the Nile enters the desert, not a single permanent tributary joins the river; and between Khartum and Assuan there are as many as six cataracts, which more or less hinder or actually stop navigation.
- (3) On the other hand, the Lower Nile provides 800 miles of unbroken navigation outside the Tropics toward the great markets of Europe; and the fertilising mud brought down by the Blue Nile and the Atbara is deposited along the banks of the river instead of being carried out to sea. Cf. p. 31.

4. The Niger rises in forest-clad hills quite close to the Sierra Leone coast, and flows directly inland for 1000 miles—to the latitude of Timbuktu and the longitude of London—before the edge of the Sahara plateau diverts it to the south-east.

- (1) These hills have one of the heaviest rainfalls in Africa, which accounts for the river's volume.

- (2) The proximity of the desert, as in the case of the Nile, accounts for the deficiency of tributaries.
- (3) The lowness of the watershed accounts for the comparative absence of cataracts except near Rabba, where the river breaks through the West Coast Range to the sea.

5. The commercial and political importance of the river is, therefore, immense.

- (1) The main stream commands the Western Sudan, and its Benué tributary commands the Central Sudan, as the Nile commands the Eastern Sudan.
- (2) It also commands a huge area of tropical forest, which must be of untold value, quite apart from the value of the river itself as a highway of commerce.
- (3) Consequently, the Niger, like the Nile, is the centre of some very difficult political problems; and, like the Congo, it will be the centre of an enormous and most valuable trade.

6. The Zambesi has been called the 'Congo' of the East Coast, and it certainly is much the most important river along the coast, especially to Europeans.

- (1) Like the Congo, it flows right across the plateau; it is entirely within the Tropics; and the northern and southern limits of its basin are very vague—streams flowing indifferently and according to the season into the Zambesi or into the Congo and Lake Ngami.
- (2) Unlike the Congo, it flows eastward; it has a much larger proportion of its basin north of its course than south of it; and the level is uniformly very high—owing to the general slope of the African plateau from east to west.
- (3) This slope causes its chief central tributary, the Loangwa, and all the tributaries from the Matoppo Hills, to flow from the east, as the main stream itself does at first, under the name of the Liba.

- (4) The Zambesi gives easy access to the high-level lake region, which is the healthiest part of Tropical Africa, and therefore the part of most value to Europeans ; and this region also connects the Zambesi with the Nile, *vid* the Stevenson Road and the Great Lakes.
- (5) The obstacles to navigation are mainly, the silting up and shifting of all the delta channels except the Chindé, the dangerous rapids at the edge of the plateau above Tete, the 50 miles of the Murchison Rapids on the Shiré, and the wonderful Victoria Falls, where a mile's width of water drops suddenly 400 feet into a chink of 100 yards in width.

7. The Orange River and the Limpopo are not much more than feeble caricatures of the Nile and the Niger.

- (1) The Orange River rises in two main streams amongst the Draken-Berge heights, where the rainfall is abundant, and flows right across the continent for 1200 miles ; but it suffers so much loss of volume in the desert that it would be practically useless for navigation, even if its course were not broken by the Great Anghrabies rapids and its mouth blocked by a bar.
- (2) The Limpopo rises on the famous Witwatersrand, and empties near enough to the fine harbour of Delagoa Bay for its 60 miles of navigable water to be very useful for commerce ; but its chief use is as an indisputable political boundary to the Transvaal. Like the Niger, it makes a great curve back on itself, and all its main tributaries drain the plateau within the curve.

Lesson 9. Lakes.

1. The African lakes are of two main classes—those which have, and those which have not, any permanent outlet.

- (1) The former are fresh, and are generally connected with one of the four great oceanic rivers; the latter are saline, and are generally connected with one of the three large areas of inland drainage.

2. The saline lakes may again be divided into two kinds.

- (1) The larger, *e.g.* Lake Chad and Lake Ngami, are in the heart of the continent along the tropic edge of the Sahara and Kalahari Deserts; and, as they have outlets when they are very full, their salinity varies.
- (2) The smaller, *e.g.* Lake Rudolf and Shott Melrikr, are along the outside rim of the general plateau, most of them being along the Mediterranean and Red Sea coasts.
- (3) Both kinds vary immensely in size. For instance, in the rainy season Lake Chad rises from 20 to 30 feet, and expands into an inland sea as large as Switzerland or Greece; and its chief tributary, the Shari, becomes a navigable waterway.

3. The fresh-water lakes are also subdivided into two classes.

- (1) All the most important, *e.g.* the Victoria Nyanza and Lake Tanganyika, lie along the continental axis of the high eastern plateau, where they form large reservoirs for the great rivers, especially the Nile.
- (2) The less important ones, *e.g.* Stanley Pool and Lake Delu, are simply expansions of the great rivers, and are common in the Niger and Congo basins, where they are very useful in regulating the currents and controlling floods.

- (3) The former are evidently destined to play an important part in any trans-continental trade route from north to south, and the equatorial group are generally called the Great Lakes.

4. The Great Lakes 'radiate' at various heights from the Victoria Nyanza, which stands actually on the Equator, at a height of nearly 4000 feet.

- (1) In the Nile system, Lake Albert Edward is 800 feet lower than the Victoria Nyanza, and the Albert Nyanza is 800 feet lower than Lake Albert Edward.
- (2) In the Congo and Zambesi systems, Lake Tanganyika is 1300 feet lower than the Victoria Nyanza, and Lake Nyasa is 1100 feet lower than Lake Tanganyika.
- (3) The highest lake in Africa, however, is Lake Tsana, from which the Blue Nile issues nearly 2000 feet higher than the White Nile issues from the Victoria Nyanza; and Lake Bangweolo comes third.

5. By far the most important of these Great Lakes are Victoria Nyanza, Tanganyika, and Nyasa.

- (1) The Victoria Nyanza, the largest fresh-water lake in the world except Lake Superior, is nearly as large as Scotland; its circular basin is about 200 miles across, and has gently sloping sides; its chief feeder is the Kagera, and its chief outlet is the Somerset Nile.
- (2) Lake Tanganyika has not quite half the area of the Victoria Nyanza, but it is the longest fresh-water lake in the world; it runs in a deep, steep-walled trench for nearly 400 miles; its chief feeder is the Malagarazi, and any surplus waters escape into the Congo *via* the Lukuga.
- (3) Lake Nyasa, which is similar to Lake Tanganyika both in shape and shores, though smaller, is still twice the size of Lake Ladoga (= Wales); it is joined to Lake Tanganyika by the famous Stevenson Road, and discharges its surplus into the Zambesi, *via* the Shiré.

CLIMATE AND PRODUCTIONS.

Lesson 10. Climate.

1. Africa extends over 70° of latitude, *i.e.* twice as many as Europe.

- (1) Tunis is in the latitude of Tokio, and Algeria in that of North Carolina; Cape Town is in about the same latitude as Buenos Aires, and Natal is in the same as New South Wales.

2. The size of the continent is, therefore, so enormous that there must be great differences of climate; but so much of the surface is within the Tropics that the actual heat of the sun does not vary greatly, and the main differences are due to height and moisture.

- (1) Owing to the shape of the country, much more land falls within the Tropics in the north than in the south.
- (2) The continental northern area is, therefore, both hotter and drier than the peninsular southern area.
- (3) The proximity of Europe and Asia further increases the drought and the heat in the north, while the greater height of the south diminishes both.

3. The word climate means 'slope,' and the slope has a great effect on what we call 'climate.'

- (1) The heat of the sun's rays varies with the angle at which they fall upon the earth—a direct ray being warmer than an indirect one, both because it covers less ground and because it comes through less atmosphere.

be carried to it during that half ; and, therefore, the one Tropic is marked by the Sahara, and the other by the Kalahari Desert. Cf. the Australian and Chile Deserts.

- (5) The narrow triangular peninsula naturally gets a much larger proportion of rain than the broad continental oblong, and therefore has much more forest and much less desert. For the same reason it is also much more unhealthy except up on the plateaus.

7. The west coast of the peninsula gets much less rain than the east coast, partly because the regular winds blow off shore, and partly because the cold Benguela current evaporates very slowly.

- (1) Inhambane gets seven or eight times as much rain off the warm Mozambique current as Walvisch Bay gets off the cold Benguela current, though at neither place are there regular winds blowing landwards.
- (2) Owing to the same cause, the average temperature of Walvisch Bay is 10° colder than that of Inhambane, and the average temperature of Benguela is about 20° colder than that of Mozambique.
- (3) Where cold and warm currents meet, as off Cape Agulhas, 'The Needles,' there are constant fogs. Cf. the Newfoundland Banks and the Malström.

Lesson 11. Productions.

1. The vegetation, of course, depends on soil and climate ; and it may be roughly classified as temperate and tropical.

- (1) In both cases there are strong contrasts owing to differences of rainfall.

2. The Temperate regions of the extreme north and the extreme south have a very similar climate—with winter rains, and produce very similar plants.

- (1) For instance, the vine flourishes as well in Algeria as in Cape Colony ; the pastures of Marocco produce as good wool and mohair as the Karroos ; the forests on the seaward face of the Atlas correspond to those on the seaward face of the Storm-Berge ; and the semi-desert alfa (esparto) of Algeria and Tunis has its counterpart in the heaths of the Orange basin.

(3) The Tropical vegetation varies immensely—
with the rainfall.

- (1) The desert and semi-desert regions have a very limited flora of their own—various species of mimosa and acacia being most common, and the date palm being the most valuable.
- (2) In the low West-Equatorial region, where heat and rain are evenly distributed throughout the year, there is typical 'Tropical' vegetation or 'wet jungle'—dense forest, with the oil palm and the numerous creepers which yield india-rubber.
- (3) In the high East-Equatorial region, the typical formation is the savannah—wide stretches of grass, with or without trees ; and the typical tree is the euphorbia or the baobab.

4. The whole continent may, therefore, be roughly divided into seven natural regions.

- (1) The Mediterranean region produces the olive, the fig and the vine, and—in the drier areas—large quantities of alfa, which is exported mainly to the French paper mills. The rainfall, as in South Europe, is practically confined to the winter and spring.
- (2) The Sahara region produces the date palm, and supplies sufficient pasture for the various nomadic tribes—Hamitic and Semitic—whose nomadic habits are the result of their wanderings in search of pasture. Except in a few specially favoured places, the pastoral

wealth is limited to camels, because, as the region is almost rainless, the vegetation is generally limited to plants with leaves so small, or so leathery, or so thorny, that there is little or no evaporation from their surface, *e.g.* gum-acacias and tamarisks. Cf. p. 40.

N.B.—There are also plants which store water in bulbous roots. Cf. the Kalahari Desert, p. 85.

- (3) The soil and climate of the continental Sudan admit of both pasture and agriculture—the ruling Hamitic race being devoted to cattle-rearing, while the subject Negroes cultivate durra and other plants.
- (4) The Nile valley forms naturally a separate region, dependent for moisture on the annual inundation of the river; and its resources are almost entirely agricultural, especially cotton, wheat, and pulse. Its most typical native plant is the papyrus, which grows round lakes and along sluggish streams.

N.B.—The average rise of the Nile is 24 feet; less than 22 feet is not sufficient, and more than 26 feet does great damage.

- (5) Western Equatorial Africa, with its intense humidity and even heat, is the home of the pure Negro and the anthropoid apes. The high even temperature and the constant rain make it a region of dense forest, with dark tangled undergrowth; among its most valuable plants are the oil palm, the banana, the ebony, the coffee-shrub, and various rubber-producing creepers.
- (6) The Great Eastern Plateau consists largely of savannahs, the home of 'big game,' and equally suitable for pasture or agriculture. The facilities for pasture tempted the Hamitic nomads to expand southwards over the plateau; the western savannahs produce, under Negro cultivation, large crops of millet, cassava, or other food-plants; and Europeans have introduced coffee. The year is divided into dry and wet seasons.
- (7) The extreme south reproduces more or less the conditions of the extreme north, with the same contrast

of semi-desert pasture inland and agriculture along the coast. Sheep, goats, and the vine flourish in both areas; but in the south the ostrich replaces the camel, and maize and tobacco replace the olive and the fig. The area of desert in the south is also comparatively insignificant.

5. The vegetation thus reflects some of the physical characteristics which have made Africa historically 'The Dark Continent.'

- (1) The most fertile parts are the most unhealthy, and the difficulty of getting food in the healthier parts led to cannibalism.
- (2) The physical uniformity of large areas did not favour the growth of clearly-defined states with political and commercial organization. Cf. the Guachos of the Pampa.
- (3) A savage population, with no instinct for political combination, naturally made no demand for foreign goods; and there were no vegetable products to support any extensive export trade, commerce being practically confined to slaves, ivory, and gold.

6. The characteristic fauna of Africa may be roughly classified under three heads.

- (1) The desert regions produce the camel and the ostrich, and in Egypt there are also many varieties of aquatic birds, *e.g.* the stork, pelican, and flamingo.
- (2) The West-Equatorial forest region is unfavourable to animal life, but is the home of the gorilla and the chimpanzee, the elephant and the hippopotamus.
- (3) The Great Eastern Plateau has an abundance of large animals, including the lion and the elephant, the giraffe and the zebra, the crocodile and the rhinoceros; and 'big game' are generally attended by the dreaded tsetse fly.

N.B.—The animal products include, therefore, ivory, ostrich-feathers, and skins. North and South Africa also export wool, and Madagascar and West Africa export wax.

7. The mineral products include coal and iron, gold, copper, diamonds, and salt.

- (1) Coal has been found in the Zambesi basin, but is worked only in Natal, Cape Colony, and the Dutch Republics.
- (2) Iron is known to exist in considerable quantities over most of Tropical Africa, and there are rich deposits of it in the Atlas Region. It is worked mainly in Algeria, and is exported from Benisaff.
- (3) Gold is exported from South and South-East Africa, and from the Gold Coast ; and the deposits in the south-east are very rich, especially in the Transvaal.
- (4) Copper is worked mainly in Cape Colony, Darfur, and the Atlas Region.
- (5) The diamonds are practically confined to the Kimberley district of Cape Colony, and the salt 'shots' are most productive in the Western Sahara.

NORTH AFRICA.

Lesson 12. The Barbary States.

1. North Africa may be divided into two parts—a mountainous western part and a low eastern part.

- (1) The height and the nearness to the Atlantic give the western part a much better rainfall than the eastern; but in both parts the Mediterranean slope has much more rain than the Sahara slope.
- (2) The Morocco Range, or Great Atlas, is a real mountain range, with a lower parallel chain in the Anti-Atlas; it is much the highest land in North Africa, and forms a distinct water-parting, *e.g.* between the Draa and the Sebu.
- (3) In Algeria and Tunis the formation is really a broad plateau with buttress ranges. The plateau is covered with salt-swamps, or shotts, between which there are large areas of alfa (*esparto*); the seaward buttress contains a number of fertile valleys, known collectively as the Tell, amongst which the ordinary south European fruits and cereals are grown.
- (4) Tripoli is a still lower plateau, descending to the Jefara Plain and rising to the Barka Peninsula.

2. The products of the region correspond to its physical features.

- (1) The sheep and goats of the Great Atlas support the characteristic leather and carpet industries of Morocco.
- (2) The Tell valleys produce excellent wheat and barley, olives and grapes, oranges and lemons, while the plateau produces salt and *esparto*. The latter, however, is becoming less and less important, owing to the increasing use of wood-pulp in the paper trade.

(3) The oases of Tafilet and Fezzan produce famous dates.

N.B.—Many artificial oases have been made by boring Artesian wells.

3. The Marocco towns may be classified as centres of commerce and centres of government.

- (1) The commercial centres are generally ports. Thus, Tangier is the medium of communication with the outside world for the North of Marocco, as Dar el Beida and Mazagan are for the centre, and as Mogador is for the south. Tangier, as the nearest to Europe, is much the most important.

N.B.—Spain owns the fortified port of Ceuta.

- (2) The political centres generally command inland communication from sites of military strength or agricultural wealth. Thus, Fez and Mequinez command the upper basin of the chief river of the country, the Sebu, while Marocco (=Marakesh, 'The Adorned,') commands the fertile plain of the Tensift.
- (3) Fez, the largest city in the country, occupies a fine strategic position up amongst the spurs of the Atlas, from which it collects the materials for its leather and 'Fez' cap industries. The *carmine* colour of the caps is due to the presence on the Atlas slopes of the species of oak which supports the *kermes* insect.

N.B.—The charge for transport (by mule or camel) from Tangier or Larache to Fez, or from Mogador or Safi to Marocco, varies enormously; dear grain, a heavy track, or a flooded river, is enough to cause at once a rise in prices.

4. The Algerian towns are all found in the narrow strip between the outer terrace of the Atlas and the sea; but most of the people are scattered over the fertile Tell in agricultural villages, and do not live in towns at all.

- (1) Oran and Mostaganem are commercial centres in the west, as Bona and Philippeville are in the east; and owing to the nearness of the outer terrace to the

sea, the railway system connecting them with Algiers runs entirely inland parallel to the terraces, *e.g.* along the valley of the Shelif.

N.B.—Bona is the old Hippo, and Oran is the old Portus Divinus (so-called from its sheltered harbour).

- (2) Constantine, on the top of an almost impregnable rock, is the largest inland town ; and there are important centres at Biskra and Tlemcen, and in the oases of Wargla and Tuggurt, which command the traffic converging on Tuat for Timbuktu. Constantine has a soap industry in connection with the residue from the olive-oil mills.
- (3) Algiers, or 'The Islands,' is an extremely important place. It divides the distance between Port Said and London better than either Malta or Gibraltar ; it has a safer anchorage than Gibraltar, and gives greater facilities to shipping. For instance, it has a small basin specially reserved for men of-war ; its large area makes it very useful as a fishing-port and a refuge ; and it has the advantage to merchantmen of two docks for repairs, abundance of fresh fruit and other provisions, and ample room for such bulky items as timber, coal, and wine casks.

5. Tunis has no town of great importance except its capital.

- (1) Bizerta and Goletta are commercial centres on the north coast, as Susa and Sfax are on the east coast, exporting mainly cork and esparto.
- (2) Susa commands the route inland to the sacred city of Kairwan.
- (3) Tunis, like the ancient Carthage, owes its importance, not to the wretched harbour of Goletta, but to its position in the most central and narrowest part of the Mediterranean, with easy communication inland up the Mejerda valley. It has also now a ship-canal to the sea.

6. Tripolitana owes its importance to the number of caravan routes which converge on it.

- (1) The reason for this is that, owing to the deep indentation of the Sidra-Gabes Gulf, the starting-points of the caravans—Tripoli, Khoms, and Benghazi—are 250 miles nearer to the Sudan than Oran, Algiers, Philippeville, or Tunis; and even the railways from Oran and Philippeville to Ain-Sefra and Biskra cannot compete with the Tripolitan routes, which might themselves be immensely improved by railways from Tripoli to Ghadames and Murzuk.
- (2) Ghadames is the most important inland centre in the country, and has trade routes diverging from it in all directions—to Wargla, Ain-Sala, Ideles, Ghat, Murzuk, etc.; and Murzuk comes next in importance, with the same staples of trade—ostrich feathers, skins, and ivory. None of these, however, are as important as the barley of the coastal districts.
- (3) As both the Ghadames and the Murzuk routes converge on Tripoli, it naturally does most of the foreign trade (in barley, feathers, skins, ivory, and esparto), and is the natural site for a political capital; but its harbour is shallow and dangerous. Its local industries are concerned with the preparation of feathers for the Paris, ivory for the London, and goat-skins for the New York markets.
- (4) The only other harbour of any importance along the surf-beaten coast is Benghazi, which commands the trade-route to Lake Chad, *via* the oases of Anjila and Kufra.
- (5) The other large towns, *e.g.* Zavia, Misrata, Zeliten, and Gharian, are concerned, like Tripoli, with the preparation of ivory, skins, and feathers. The skins come entirely from Kano, *via* Agades and Ghat, and the best ivory and feathers come also by the same route; but an inferior ivory, full of crevices and very brittle, comes from the open park-land of Wadai.

7. Under the French flag Algeria and Tunis have made more progress than Marocco and Tripoli.

- (1) Apart from its political importance, Algeria is most useful to France as a great wine-producing country only one day's sail from Marseilles; and the cork-oak forests of the Atlas supply abundance of cork excellently suited to bottling purposes.
- (2) Marocco is still under an independent Sultan only because none of the European Powers will allow it to be annexed by any other Power, but French influence is gradually spreading over it.
- (3) Tripoli is still a Turkish province.

THE CALMS OF CANCER.

Lesson 13. The Sahara.

1. The Sahara forms the western terminus of the great belt of deserts which stretches across the Old World from Mongolia to the Atlantic.

- (1) It is much the largest of the series, being nearly as large as Europe. The Arabian desert comes next in size, and the Mongolian third.

2. It is not a dead level; it is not a sea of sand; and it is not entirely without vegetation.

- (1) Most of it is a low plateau; and one of its characteristics is the presence of small, isolated, rocky plateaus, with perpendicular cliffs.

- (2) It also contains some mountain ranges; and those which shut in Lake Chad to east and west—the Tibesti and the Air—are between 6000 and 7000 feet high, and precipitate considerable quantities of rain in summer.

- (3) The Libyan Desert, however, is more or less a level stretch of sand, and there is a similar area in the west—the Gidi Desert.

3. The cause of the desert is simply the absence or the deficiency of rain.

- (1) The North Tropic is the centre of a belt of calms in January, as the South Tropic is in July. Cf. p. 28.

- (2) In summer the intense heat over the sandy Sahara draws winds inland, but the heat itself tends to evaporate rather than to precipitate moisture.

- (3) On the seaward edge of the desert, where the winds are naturally wettest, there is either no condensing medium, *e.g.* in the Libyan and Gidi Deserts, or the medium is an absolute barrier to the passage of the winds inland, *e.g.* the Atlas.

4. The amount of sand is due partly to the variation of temperature and partly to the absence of vegetation, and it is distributed partly by wind and partly by water.

- (1) The enormous variation in temperature between day and night splits up the solid rock in all directions—to be distributed by wind.
- (2) Besides the storms on the mountains, there are also summer storms on the southern edges of the desert, where the dry Saharan air meets the moist equatorial air; and, as there is no vegetation to bind together the surface, the consequent torrents carry down with them immense quantities of loose soil.
- (3) The porous nature of these shifting sands, especially in the Hammada, enables any rain to sink into the ground before it can be evaporated, and this encourages the boring of Artesian wells (cf. p. 35); while the impervious nature of the 'shott' beds allows any surface water to be evaporated before it can sink, thus covering the ground for miles with a crust of salt, especially in the Western Sahara.

5. The vegetation is of two kinds—a real desert kind and an oasis kind.

- (1) The oases supply the date-palm, the most important product of the Sahara; and cereals and fibres (cotton and tobacco) are also grown in them.
- (2) The true desert vegetation consists of plants which, by lengthening their roots or shortening their height or thickening their bark or limiting the size of their leaves, have adapted themselves to draw water from great depths or to resist the evaporating power of the intensely dry air. Cf. p. 31.

6. The population varies, both in number and in nationality, with the supply of water.

- (1) The centres of population are naturally where the water supply is most permanent, *i.e.* in the oases, *e.g.* Bilma, Kawar, and Adrar, and on the mountain-slopes, *e.g.* Tibesti, Borku, and Air (=Asben).
- (2) As the spring-water of the oases is much more reliable than the summer rains on the mountains, agriculture is practically confined to the oases; and, therefore, they have a fixed Negro population. Cf. p. 31.
- (3) The typical desert people are not fixed and agricultural, but nomad and pastoral; and, therefore, the population of the Sahara generally is a wandering Hamitic one. Cf. p. 30.

N.B.—The dry air of the desert makes the Hamitic nomads much healthier and harder than the fixed Negro population of the moist oases.

7. The trade of the Sahara is partly a transit trade and partly local, and it is all done by the camel.

- (1) There is a natural exchange of products between the temperate, coastal Barbary States, and the tropical, continental Sudan. From the north come the grain, cheese, and wool of Algeria and Marocco, and various European goods, *e.g.* cotton, tea, sugar. From the south come gold, slaves, ostrich feathers, ivory, gums, and wax.
- (2) The local trade is in the two desert staples, dates and salt. The dates come mainly from the northern oases, *e.g.* Tafilet and Murzuk, and are exported northwards; the salt comes mainly from the really 'desert' parts of the south-west, and is exported southwards, especially from Tanderi to Timbuktu.
- (3) There are five great trade-routes. The most important and the most central is from Tripoli, *via* Ghat and Air, to Kano. The others are from Mogador, *via* Tenuf, to Timbuktu; from the Atlas region, *via* Tuat, to Timbuktu; from the Fezzan, *via* Kavar and Bilma, to Kuka and Lake Chad; and from Benghazi, *via* Aujila and Kufra, to the Wadai country.

THE SUDAN.

Lesson 14. General Features.

1. The Sudan stretches across the continent from the Atlantic to the Nile Valley, between the Sahara and the peninsular plateau.

- (1) The proper name for the region is *Bilad-es-Sudan*, i.e. 'the Land of the Blacks.'

2. It may be roughly divided into two very distinct areas—a continental plateau and a coastal plain.

- (1) The continental area consists mainly of open savannahs at least 1000 feet above the sea, but includes also the low basins of the Senegal and the Gambia.
- (2) The coastal area consists mainly of a narrow strip of low-lying forest-clad land along the Gulf of Guinea, but includes also the forested escarpment of the plateau.

N.B.—The name *Sudan* is often restricted to the continental area, the coastal area being called Upper Guinea. The 'Eastern Sudan' falls under the Nile Region. Cf. p. 49.

3. The continental area consists of three drainage systems—the basins of the Senegal and the Gambia, of the Niger, and of Lake Chad.

- (1) These three areas represent the typical African features of a coastal watershed, a great continental waterway, and an area of inland drainage.
- (2) All these are composed mainly of old crystalline rock, but the fertility and the rainfall vary with the distance from the Sahara.
- (3) The northern border is a series of sand-dunes; the southern is a strip of forest; and, between the two, durra, cotton, beans, rice, and indigo are widely cultivated—the product varying with the rainfall.

4. The coast-lands are divided by Cape Palmas into two distinct regions.

- (1) The eastward region is naturally sheltered from the western gales which cause such devastation between Cape Palmas and the Senegal.
- (2) The Guinea current has carried so much sand shoreward, and the Atlantic tides have so completely checked the course of the coastal rivers seaward, that a false shore has been built up, backed by lagoons, along most of the eastern coast.
- (3) Between these lagoons and the old shore there is a belt of dismal swamp, to which the Ivory and the Slave Coasts mainly owed the particular products that gave them their names; but the wealth of the country now lies in the oil-palms and rubber-creepers which grow to perfection in the deadly moist, hot, even climate.

5. The distribution of people and their occupations are characteristic of Africa.

- (1) The Black Man is the product of the intense heat and moisture of the Guinea Coast, which—by greatly increasing the supply of blood—increases the supply of colouring matter in the body; and he is naturally stationary and agricultural, growing bananas and maize on the forest-clad lowlands. There the dense masses of dark, damp forest have overwhelmed him, physically and morally, and left him—except in the open Yoruba country—passive and superstitious.
- (2) The Hamitic races are essentially nomadic and pastoral, but are not found pure in the Sudan. In their place there is a mixed race with mixed habits, of whom the Fulbe and the Hausas are the best types. They are hardy and sanguine, agricultural and pastoral, nomadic and stationary, traders and settlers.
- (3) The Fulbe were cattle-rearers in the Futa-Jallon highlands before, like the Arabs elsewhere, they con-

quered the Negro tillers of the soil ; and the Hausas were local carriers along the Benué before they became the great traders of the Sudan, and made their language the great commercial medium throughout the Sudan and even over part of the Sahara.

6. The Trade routes in the Sudan, unlike those in the Sahara, run east and west.

- (1) The reason for this is that commerce was impeded by the sand-dunes along the north and by the dense forest along the south, but was encouraged by the savannah plateau in the centre and by the general east-and-west direction of the rivers.
- (2) Consequently, too, nearly all the old commercial centres lie along the Sahara border, *e.g.* Kuka, Kano, and Sokoto, or along the southern forest-belt, *e.g.* Kong, Sulaga, and Ilorin.

7. The productions vary with the moisture, the heat being everywhere excessive.

- (1) The heavy damp heat of the coast-lands and the Lower Niger produces the oil-palm, rubber-creepers, and ebony.
- (2) The broad central strip of the interior produces durra, millet, sorghum, cotton, and indigo, and contains splendid cattle pasture on the Upper Niger and equally good horse pasture in Bornu.
- (3) The arid northern strip produces ostrich-feathers and goat-skins, while the forested southern strip produces ivory.

Lesson 15. Political Divisions.

1. The Sudan illustrates three very important terms in political geography—‘Sphere of Influence,’ ‘Hinter-land,’ and ‘Line of Least Resistance.’

- (1) The mass of Africa is held or 'influenced' by various European nations, mainly the French and the British; and the Sphere of Influence is the area within which the missionary or mercantile interests of any particular nation are predominant, *e.g.* French interests in the Sudan and North Africa, and British in Egypt and South Africa.
- (2) The term 'Hinterland' applies to such part of the interior as may fairly be said to go naturally with any particular strip of coast; but its meaning has been terribly strained by the French, *e.g.* along and behind the Guinea Coast.
- (3) Occupation of such a strip of coast is essential to any claim on the Hinterland, but European colonisation of the African coast—at least, within the Tropics—is practically impossible; and, therefore, European domination needs a good harbour and easy access inland. Such access follows the Line of Least Resistance, which is generally a river valley (cf. the Senegal, Niger, Benuë); and the influence of the particular nation is focused at the harbour (cf. Massawa, Mombasa, Lourenço-Marquez).

2. The mass of the Sudan is divided between France and Britain.

- (1) Germany owns the little colony of Togoland, which trades, *via* Bismarckburg, with the great continental markets of Sulaga and Yendi, and the unexplored Kamerun country.
 - (2) Portuguese Guinea has easy access up the Rio Grande valley to the Futa-Jallon highlands; its capital and chief harbour, Bissao, is on an island (cf. Konakri, Grand Bassam, and Lagos).
 - (3) The independent State of Liberia has given its name to a lowland species of coffee which is exported from Monrovia.
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3. The British domains include the Gambia, Sierra Leone, Gold Coast, Lagos, the Niger Coast Protectorate, and the Royal Niger Company's Territory.

- (1) The Gambia Colony has an estuary which admits the largest vessels, and the river is navigable for 250 miles; but Bathurst is the only town, and ground nuts are the only important product.
- (2) Sierra Leone, like the Gambia, is entirely cut off from the interior by French territory; but the shelter of the Freetown peninsula makes the Rokelle estuary the best harbour along the whole coast, the position half-way between England and the Cape gives it political importance, and the deadly damp heat and the volcanic soil produce in luxuriance such products as oil-palms, kola, rubber, gum-copal, and pepper.

N.B.—The 'Grain' Coast takes its name from the kind of pepper known as '*Grains of Paradise*.'

- (3) The Gold Coast is not nearly so famous for gold as it was in the days when it gave a name to the English *guinea* coin, though it produces actually more gold-dust. Its most valuable products now are palm-oil, rubber, and ebony. Accra is its capital and its largest town, but Cape Coast Castle commands the only good road inland (to Kumasi and Bontuku).
- (4) Lagos itself is an island-town on the sandbank which separates the coastal lagoons from the sea; but, as it is the outlet for the palm-oil and palm-kernels of the Yoruba district, and has a safe harbour and easy communication inland, it has become the most important town on the Gulf of Guinea.

N.B.—The size of the Yoruba towns, *e.g.* Abeokuta, Ibadan, and Oyo, is a relic of the slave-trading days, when all the inhabitants of the country took refuge behind their walls.

- (5) The Niger Coast Protectorate and the Royal Niger Company occupy the rest of the Guinea Coast up to the Kamerun frontier; the political centre of the

region is Asaba, the naval centre is Akasa, and the military and commercial centre is Lokoja. The Niger is, of course, the natural outlet for the Central Sudan; but the local products of this lower basin are more or less limited to oil, rubber, and ebony.

- (6) The continental domains of the Royal Niger Company include the whole Sokoto empire and its dependencies. The chief centres are the political capital of Wurnu; the river-ports of Rabba and Egga, of Loko and Yola; the great markets of Kano and Yakoba; and the caravan termini of Kuka, Katsena, and Sokoto.

Kano is the commercial capital of the Central Sudan, being the terminus of the chief Saharan route, and manufactures blue cottons from the product of the surrounding cotton and indigo lands. Rabba owes its importance to the transport round the Niger rapids, and Yola to the transport of ivory from the Adamawa forests

4. The French domains include Senegambia, French Guiana, and the French Sudan.

- (1) Senegambia includes all the lower basins of the Senegal and the Gambia, except the British strip along the Gambia; but its commercial value is not very great, the products being more or less limited to ground-nuts and some rubber and gum. The capital, St. Louis, stands on an island in the Senegal estuary; but it is so much impeded by a shifting bar that a railway has been built from it to Dakar Bay under the shelter of Cape Verde.
- (2) The French 'Sudan' has its capital at Kayes, on which most of the foreign traffic at present converges; and amongst its other important centres are Bafulabe and Bamako, where traffic respectively leaves the Senegal and strikes the Niger; and Kong, which commands the Kornoe Valley. Timbuktu, which is connected with its port of Kabara only at high water, is much less

important than it used to be ; but some of the eastern towns are growing very important, *e.g.* Abeshr and Masenga.

- (3) French Guiana now includes the old colony of the same name, the Ivory Coast, and the French Slave Coast. It produces rubber, palm-oil, sesame, and gum ; and its chief towns are Konakri, Grand Bassam, and Whyda (the port of Abome).

THE NILE REGION.

Lesson 16. The Eastern Sudan.

1. The Nile valley may be divided into five natural zones—of delta, desert, steppe, savannah, and lake.

- (1) The Lake zone belongs entirely to the Great Eastern Plateau (cf. p. 60), but its importance to Egypt is very great, because it is to the lake reservoirs that the Nile owes the constant and reliable part of its volume. The White or 'Clear' Nile also owes its clearness to the filtering of its mud in the lakes.
- (2) The Savannah zone lies between Lado and Fashoda ; and its general surface is so level that the current becomes very slow, and the river is often choked with enormous masses of floating vegetation. Similar masses are brought down from the Nile-Congo water-parting by the Bahr-el-Ghazal and its numerous tributaries ; and it is partly the impact of the latter, though mainly the abrupt rise of the Bagara plateau, that makes the Nile curve so sharply eastward.
- (3) The Steppe zone lies between Fashoda and Berber, and shows a gradual transition from a fertile rainy district to a barren dry one. The zone is, however, very important, because it is to the torrential rains round the sources of the Blue or 'Muddy' Nile that Egypt owes its fertilising inundations.
- (4) From its confluence with the Atbara, its last permanent tributary, the Nile enters on its desert course, during which it loses so much water by evaporation that its volume actually diminishes as it approaches the sea (cf. The Orange, p. 23). The five cataracts between Berber and Assuan are a succession of rapids caused

by rocks which impede or prohibit navigation except at very high water.

- (5) The Delta proper begins just below Cairo with the Barrage weir, which controls the irrigation of all the deltaic lands; the Fayum has so much in common with the Delta that they may be classed together.

2. The Savannah zone has ordinary 'Tropical' climate and vegetation, and its importance is mainly commercial.

- (1) The year is divided into two long rainy seasons, with a short dry season between them; and, therefore, the products include rubber, gums, cotton, and ivory (from the forest area). All the export trade converges on Fashoda.
- (2) The Nile is so much choked with floating vegetation above Sobat that continuous navigation is quite impossible; but the splendid river-side pasture has made even the Negro tribe of Denkas forsake their customary agriculture for cattle-rearing.
- (3) The Nile-Congo waterparting is so rich in iron ore that the Bongo Negroes have also forsaken their ordinary occupation of tillage for that of skilled mechanics; and the prevailing ruddy colour of the iron-impregnated soil is even reflected in the reddish tinge of their skins.

3. The Steppes zone is characterized by thorny scrub and rugged heights, and its importance is mainly political.

- (1) The position of Berber or Kassala would enable any hostile Power on the Upper Nile to divert all the transit trade of Egypt to Suákin and Massawa.
- (2) The possession of Khartum (Omdurman) would enable such a Power to command three great waterways—north, south, and south-east—and to control the whole supply of water and mud which alone makes agriculture possible in Egypt.

- (3) In the same way the Kordofan capital of El-Obeid commands the caravan trade, *via* El-Fashr, with the rich wheat and tobacco lands of Darfur, the copper mines of Hofrat, and the general trade of the Eastern Sudan.

Lesson 17. Egypt.

1. The most important feature of the Desert zone is the long narrow trough hollowed out by the river, which is the key to the history of the whole country.

- (1) It has been the one great highway of commerce and communication through a land naturally isolated by barriers of desert or sea on every side; and thus it helped to keep the inhabitants united, and facilitated the access of the White Man into the domain of the Black Man.

- (2) On the other hand, it divided Egypt naturally into two parts, Upper and Lower, Valley and Delta; and the country is so long in comparison with its breadth that it was always very difficult to govern from a single centre (cf. Italy and Chile). Thus, three different sites have been tried for capitals: Thebes (near Keneh) commanded the valley, Alexandria guarded the approach from the sea, and Cairo keeps the balance of power where valley and delta meet.

N.B.—The old name of Egypt was Mizraim, 'the two lands of red mud,' and its old kings even wore two crowns.

- (3) The banks of the river are covered with the ruins of old cities and with oasis-like vegetation. The most important products are wheat, pulse, and sugar; and the wonderful preservation of the antiquities, *e.g.* the Sphinx and the Pyramids of Gizeh or the temples and other buildings of Memphis, Thebes, and Ibsambul, is due to the intensely dry air.

N.B.—Contrast the 'weathering' of Cleopatra's Needle since its removal to the banks of the Thames.

- (4) The important centres now are either where there are special facilities for irrigation, *e.g.* Siut, or where cataracts break regular navigation, *e.g.* Assuan and the great railway junction of Wady Halfa, or where a sudden bend in the course of the river offers a 'short cut' by rail or caravan, *e.g.* Keneh, Korosko, and Abu Hammad.

2. The Desert zone has three other important features—the Northern Oases, the Red Sea Littoral, and the Suez Canal.

- (1) Important pilgrim or commercial routes follow the lines of the various oases which lie between Assuan and the Tripoli frontier. For instance, there is a great pilgrim route to Siut (for Mecca) *via* the Siwa and the Bahrieh oasis; and great commercial routes from Siut and from the Farafrah oasis converge on the Dakhel and Khargheh oases for Darfur.
- (2) The Red Sea Littoral consists mainly of a high system of barren mountains, attaining in the Jebel Zebara a height of 7500 feet and in the Jebel Gharib one of nearly 8000 feet; and it includes politically the interesting Asiatic peninsula of Sinai. But its only important centres are the ports of Kosseir and Suákin. The latter, which is the best harbour on the Red Sea, stands on an island in a natural basin of coral.
- (3) The 100 miles of the Canal save 3000 miles on the Cape route from Liverpool to Bombay, and three-quarters of the steamer tonnage using it is British; but, as the 'canal' type of steamer is by no means suited to the stormy Cape route, any block in the canal would completely disorganize our Eastern traffic except *via* the Canadian Pacific Railway—fortunately, a safe and quick route, and entirely in British territory. Port Said and Ismailia, of course, owe their very existence to the canal; but Suez has not benefited much by it.

3. The Delta consists of the refuse of the Abyssinian Mountains, and the whole of it is irrigated by artificial canals or by back-waters of the Nile.

(1) It is, therefore, by far the most fertile and most important part of Egypt, and contains more than half the total population—employed in raising cotton, maize, and rice; and, as the climate is distinctly continental, it is quite healthy except during the subsidence of the floods.

(2) The only branches of the Nile that still reach the sea are those from which the little towns of Rosetta and Damietta take their names. Damietta, the third largest town in the whole country, has nearly 40,000 inhabitants; but Rosetta, which is overwhelmed by its nearness to Alexandria, has scarcely 20,000.

✓ (3) Alexandria (over 320,000), with its fine artificial harbour, is the chief port of Egypt, and commands all traffic from or to the west. It is joined by a ship-canal to the Rosetta mouth of the Nile, and by rail to every important town in Egypt.

(4) Cairo (about 520,000), however, is the most important city in the country. It stands above the river on the most northerly spur of the eastern plateau, where all traffic must converge to enter or leave the Nile Valley; and it commands the whole rail, river, and canal system, including the Fresh-Water Canal to Ismailia. It is, therefore, the natural site for a political capital.

(5) The only other towns of any importance are agricultural centres which have become railway junctions, *e.g.* Tanta, Mansourah, Zagazig, and Damanhur.

4. The Fayum is the bed of an old lake, which is irrigated from the curious Bahr Yusuf.

(1) As the formation is limestone, the water-supply sufficient, and the level extremely low, the district is one of the most fertile in Africa.

- (2) The products are the same as those of the Delta ; and they are exported by a branch line from Medinet-el-Fayum to the river-side junction of Wasta.
- (3) The surplus waters collect in the lowest part of the old lake-bed, the Birket-el-Kerun, which is 140 feet below sea-level.

NORTH-EAST AFRICA.

Lesson 18. Somaliland.

1. North-East Africa may be roughly divided into two parts—the Ethiopian Highlands and the Somali Peninsula.

- (1) The Highlands, which are mainly occupied by Abyssinia, are broad, have a very great average height, and run from north to south; while the Peninsula, or 'Horn' of Africa, is much lower, and runs from east to west.
- (2) Except for a strip of coast along the Gulf of Aden, the whole area is nominally Italian; but, owing to the mountain ramparts, which have caused it to be called the African 'Switzerland,' Abyssinia is still independent.
- (3) The great average height makes the climate so much cooler than that of the Sudan that it does not at all suit the Negro.

2. The Ethiopian Highlands include Abyssinia proper and the Galla countries to the south.

- (1) The most important of the latter are Kaffa and Lieka, which practically form the basin of the Upper Omo, and have important markets at Bonga and Sobso respectively. Bonga has easy access, *via* the Omo valley, to Lake Rudolf, and Sobso commands the cross-trade between Gojam, Shoa, and Kaffa.

N.B.—The *coffee* plant is a native of the region, and possibly derives its name from *Kaffa*.

3. The backbone of the Somali peninsula runs eastward along the Gulf of Aden from the Upper Hawash valley to Cape Guardafui, and the whole country slopes southward from it.

- (1) As the mountains are thus confined to the north and the west, the country becomes drier and more barren towards the east and the south, ending in the rainless desert of Nogal or 'The Stony Land.'
- (2) At the same time, the height of the watershed guarantees a considerable volume of water to the chief rivers, though they shrink terribly in the dry season; and the only fertile lands are in the mountain valleys and along the Webi Shabeli and the Juba, Ogaden being noted for its camel pastures.

N.B.—The curious appearance of the Webi Shabeli on the map is due to the fact that, after flowing parallel to the coast for 150 miles, it empties into a lake 12 miles from the sea.

- (3) There are small towns along the chief rivers, *e.g.* Bardera and Logh on the Juba and Gelidi and Barri on the Webi Shabeli; but the only place of real importance is Harar, which commands the best route between the Galla countries and Zeila or Jibuti, and the trade of which will be greatly improved by the new French railway from Jibuti.
- (4) The characteristic products of the country are very excellent coffee, myrrh, and frankincense. The two latter are largely collected at the important caravan junction of Jerlogubi, and exported *via* the port of Berbera or *via* one of the El Benadar roadsteads (Magadoxa, Marka, Barava).

4. Italian influence is focused in Eritrea, where the island harbour of Massawa occupies an extremely important position.

- (1) It is the natural outlet for all the Abyssinian trade, and commands in Kassala a very convenient outpost for tapping the Sudan trade.

5. Britain and France divide the Gulf coast between them, Britain having the larger and more important part.

- (1) French Somaliland has at present only political importance, though its three ports of Jibuti, Tajura, and Obok do a certain amount of transit trade ; but the new railway to Harar may develop Jibuti at the expense of Zeila.
- (2) British Somaliland is in somewhat a similar position, its three ports being Berbera, Zeila, and Bulhar.
- (3) Britain also possesses an important strategic position in the island of Sokotra, with some commercial importance, cattle and aloes being exported from the port of Tamarida.

Lesson 19. Abyssinia.

1. Abyssinia is a volcanic plateau, nearly twice the size of Great Britain, averaging 8000 feet in height, and buttressed by very steep escarpments on the east and the west.

- (1) The east edge is steeper and higher than the west, rising to about 15,000 feet in the Simen and Gojan ranges ; and, as the prevailing wind in summer is a monsoon drawn off the Indian Ocean towards the fiery Sahara, the rainfall on these eastern peaks is very heavy.
- (2) The heavy rain, the friable volcanic soil, and the great height from which the rivers fall, cause them to plough very deep, cañon-like beds, the excavated soil being carried down the Nile to fertilise Egypt ; the sides of these gorges, where not too precipitous, are clothed with dense, fever-haunted forests ; and, therefore, communication becomes almost impossible except in the Tsana basin.
- (3) The surface is thus cut up into a number of small island-like plateaus, which, owing to the volcanic soil and the heavy rainfall, are extremely fertile, and tempt even the non-negro population into agriculture, while the mountain slopes supply splendid pasture.

2. The political divisions of the country and its economic isolation are, therefore, the direct result of its surface features.

- (1) Thus, the Takazze separates Tigré from Amhara, and the Blue Nile separates Gojam from Shoa; and each of these divisions is cut up into hundreds of smaller ones.
- (2) The economic isolation of the country is both maritime and fluvial; it is almost inaccessible from the sea, and its rivers have rather hindered than helped communication with neighbouring countries.
- (3) There is one fairly good trade-route, however, which both unites the greater part of the country internally and gives access to the sea; it runs from Lake Tsana through Débra Tabor and Adua to Massawa.

3. Abyssinia may be divided into three climatic zones, with corresponding zones of vegetation.

- (1) The purely 'tropical' zone is all the land below 5000 feet, *i.e.* the outer slopes of the plateau and the river valleys. They are largely covered with dense elephant-haunted forests; but in the more open parts, coffee, cotton, sugar, bananas, and indigo are cultivated.
- (2) The 'warm-temperate' zone includes the ordinary plateau lands, and produces all the cereals and fruits of South Europe as well as excellent cattle pasture.
- (3) The 'cool-temperate' zone includes all the land above 8000 feet; and its most valuable product is probably the musk deer, which accounts for the presence of musk in the exports of the country.

4. Almost all the chief towns lie in the middle of agricultural areas or on trade-routes.

- (1) Gondar, the religious capital, and Korata are on the Tsana plain; Ankobar and the political capital of Addis Abeba are in the Blue Nile Basin; and Adua and Sokota are in the Takazze basin.

- (2) Adua and Ankobar command the foreign trade *via* the Red Sea and the Gulf of Aden, the most important exports being coffee, gold, and ivory.
- (3) The fortress of Magdala stands on an almost impregnable peak, more than 9000 feet high, above the ravine cut by the Bashilo river.

EAST AFRICA.

Lesson 20. Physical Features.

1. East Africa consists mainly of a broad, high Y-shaped plateau, running from the depression marked by Lake Rudolf southward to the Zambesi gorge.

- (1) Its average elevation is about 4000 feet (nearly = Ben Nevis), and its average breadth north of Lake Rukwa is between 700 and 800 miles.

2. Like the Abyssinian plateau, it is buttressed by high mountains which overhang deep valleys.

- (1) The outward edge of the eastern buttress rises in distinct steps from a strip of low coast-land, while that of the western buttress falls almost unbroken to the Congo forests.
- (2) The broad central plateau between Lake Rukwa and the Victoria Nyanza is formed of very old crystal-line rock; but the mountain buttresses and the deep troughs below them are of much newer volcanic formation.
- (3) The highest peaks are in the eastern, *i.e.* the seaward range, where Mount Kenia and Kilima Njaro rise to a height of 18,400 and 19,700 feet respectively; the longest and deepest lakes are in the western valley, *e.g.* Lake Tanganyika and Lake Nyasa.
- (4) The highest elevation of the central plateau, like its greatest breadth, lies between Mount Ruwenzori and Mfumbiro on the west and Mount Kenia and Kilima Njaro on the east; and it forms the water-parting between the Nile and the Zambesi.
- (5) As this water-parting is just on the Equator, it catches both the N.E. and the S.E. Trades; and, as even the western buttress is not 800 miles from the sea,

and attains in Mount Ruwenzori a height of nearly 17,000 feet, the watershed has a very heavy rainfall, and is crowned with perpetual snow.

- (6) Where the two buttresses and the two lines of lakes meet, in the Livingstone Mountains and Lake Nyasa, the highest peaks do not exceed more than about 11,000 feet, and they are terribly cut off from the S.E. Trades; but they are not 400 miles from the sea, which is some compensation.

N.B.—The S.E. Trades are largely intercepted by the high mountains of Madagascar.

3. The lakes are the characteristic feature of East Africa, and they are of two distinct types—elongated and circular.

- (1) The former occur in the great valleys; and, like the typical Alpine lakes in Europe, they are long, narrow, and deep. For instance, Lake Nyasa is nearly 350, and Lake Tanganyika is nearly 400, miles long—the latter being the longest fresh-water lake in the world.
- (2) The circular lakes occur on the plateau; and, like the typical Baltic lakes in Europe, they are broad and shallow.
- (3) There is a further distinction between the eastern and the western valleys. The lakes in the eastern valley have generally no outlet, and are therefore gradually becoming salt; *e.g.* Lakes Rudolf, Baringo, and Eyassi; while all those in the western valley have an outlet to one of the three great rivers, *e.g.* Lake Tanganyika to the Congo, Lake Nyasa to the Zambesi, and the Albert Nyanza to the Nile.

4. The different types of lakes have, therefore, a very different economic value.

- (1) The circular type has the greater effect on climate; for instance, the Victoria Nyanza—which is as large as Scotland—is quite large enough to have a distinct

effect both in equalising temperature and in causing 'land' and 'sea' breezes.

- (2) As reservoirs for large rivers, the long, narrow type is the better; their nearness to the mountains increases the rainfall and causes them to be snow-fed in summer, while their small expanse of surface and the much lower elevation decrease the evaporation.

N.B.—The Nile leaves the Victoria Nyanza at a height of 4000 feet, while the Shiré leaves Lake Nyasa at a height of only 1300 feet.

- (3) As highways of commerce, the long narrow lakes are much the more useful, owing mainly to the distance over which they extend, but partly also to their lower elevation. The greater depth is a further advantage, especially in the matter of harbours; for the circular lakes have generally swampy reed-choked shores, *e.g.* Lake Bangweolo, while the long lakes have steep rocky banks.

5. Compared with the lakes, the rivers are absolutely unimportant; but several that flow seaward from the eastern buttress have considerable length and volume.

- (1) For instance, both the Tana and the Sabaki draw a large volume of water from the snowy peaks of Kenia and Kilima Njaro; and the Tana, though made difficult and dangerous by the trunks of up-rooted trees, is navigable for about 200 miles, while the Sabaki valley is the natural route for the railway from Mombasa to Lake Naivasha and the plateau generally.
- (2) The Rufiji and the Rovuma, rising in the Livingstone Mountains, have more variable volume; but each has a tributary—the Ulanga and the Lujenda—drawing its water from a swampy reed-choked valley, which helps to regulate the volume. Both of the rivers are partially navigable; and the Rovuma, like the Juba in the far north, is also a convenient political boundary.

Lesson 21. Products and Political Divisions.

1. The climate varies with the height and the distance from the sea.

- (1) The coast-lands have the greatest heat and heavy rain, except towards the Somali desert; and they are therefore covered with rank tropical vegetation, including bananas, gum-copal, and rubber-creepers. The latter are most abundant in the Wanga, Malindi, and Tana districts.
- (2) The lower steps of the plateau are dry and barren, except for strong scrub and euphorbias, especially between Kilima Njaro and Ugogo.
- (3) Those parts of the mountain slopes which are exposed to regular sea-winds, are covered with a belt of forest below a belt of bamboos. And there is still a large export of ivory from the Uganda forests.
- (4) On the plateau generally millet and cassava are the most important cultivated plants, and there are magnificent cattle pastures.
- (5) In the western trough, where the heat is very great owing to the low elevation, the rainfall heavy, and the soil very fertile, whole districts are covered with groves of bananas.

N.B.—Ivory, rubber, and cattle are the most valuable exports.

2. The occupations of the people vary with race and situation.

- (1) The cattle-rearing is mainly in the hands of Hamitic intruders from the north—especially the Masai, who live to the east of the Victoria Nyanza—and Zulu intruders from the south; and the inroads of these two bodies of intruders have greatly discouraged the more settled, *i.e.* agricultural, modes of life.
- (2) The Arab and Hindu population on the coast is composed entirely of traders—mainly in ivory and

slaves; and their example has been followed by their nearest Bantu neighbours, *i.e.* the tribes who live between Tabora and Lake Rukwa.

- (3) In the west, where the population consists almost entirely of Bantu negroes, *e.g.* Uganda, and on the coast-lands, where the climate is so favourable, agriculture is the more usual occupation; but both the races and their occupations are mixed, the British territory being healthier and more settled than the German.

3. British East Africa dominates the head waters of the Nile, and—through Zanzibar—almost all the coast trade.

- (1) Uganda is not very healthy, but is remarkably fertile, and produces excellent coffee; and the new railway from Mombasa will convert its political centres, *e.g.* Mengo, Kampala, and Mruli, into really important commercial centres.
- (2) All the centre of the country abounds in magnificent pasture, especially between Mount Kenia and the Victoria Nyanza; and the double advantage of lake navigation and railway transport will give a great impulse to the development of places like Ukassa and Ukala.
- (3) The coast-lands, especially between Taveta and Vitu, produce large quantities of rubber, which is exported *via* Wanga, Malindi, and Lamu; but most of the trade of the country goes through Kismayu northward, or Mombasa southward.
- (4) Mombasa, on a coral island joined to the mainland by a railway bridge, is the best natural harbour on the East African coast, and will be further benefited by the Uganda railway. As the bulk of trade still gravitates instinctively to Zanzibar, the old centre, Mombasa is, in the meantime, much more important than Kismayu; but the Juba Valley is a natural 'Line of Least Resistance.'

- (5) The importance of Zanzibar is largely due to its long monopoly of the East African slave-trade; but it has a splendid central position opposite some of the best natural routes inland, and is extremely fertile. The city of Zanzibar stands on the west side facing the mainland, where its shallow roadstead is sufficiently sheltered by the island itself to make a fairly good harbour.

N.B.—The revenue of Zanzibar—as of its neighbour and dependency, Pemba—is mainly derived at present from a single crop, cloves, which are unusually risky to cultivate; but copra and chillies are becoming important.

4. German East Africa is much less healthy than the British territory, but has better routes inland.

- (1) The healthiest parts are the Karagwe highlands, which have the advantage of the lake port of Bukoba, and the Livingstone highlands, which have a similar advantage in Langenburg.
- (2) The best route inland is the old slave-track from Bagamoyo to Lake Tanganyika (Ujiji), *via* Mpuapua and Tabora; but there are also good routes from Lindi and Kilwa to Langenburg and the fertile Konde district, and from Pangani and Tanga to the Victoria Nyanza *via* the fertile Ruva valley and the natural sanatorium of Kilima Njaro.
- (3) Bagamoyo owes its importance only to its position between Zanzibar and the end of the old slave-route; its rival, Dar-es-Salaam, has a much better harbour, and is bound to become the more important railway terminus.

N.B.—The slave-trade was intimately bound up with the ivory-trade, and is dying a natural death with the extermination of the elephants.

WEST CENTRAL AFRICA.

Lesson 22. Physical Features.

1. West Central Africa may be roughly divided into three areas.

- (1) A narrow strip of lowland along the Atlantic, generally known as Lower Guinea ;
- (2) The wide circular basin of the Congo, one of the most clearly marked natural divisions of the whole continent ;
- (3) The continuous belt of higher land which encloses this basin.

2. The coast strip extends from the Old Calabar to the Kunene River, and is very narrow at the two extremities.

- (1) This is the only point of resemblance between the two : the north has a very hot, damp, even climate, with rivers of permanent volume flowing through richly-wooded valleys, *e.g.* the Lom ; the south has a much cooler, dry climate, with rivers of very variable volume flowing through semi-desert regions, *e.g.* the Kunene.
- (2) The greater width of the lowlands between the Kwanza and the Ogowe is due mainly to the deltas deposited by those rivers, which have not, like the Congo, pace and volume sufficient to carry their burden of mud far out to sea. Consequently, the greatest width is at the mouth of the Ogowe, in the Lopez Delta-promontory.
- (3) The vegetation corresponds exactly to that of the rest of the Guinea coast, except in the dry southern section—the oil-palm not being found south of the Kwanza.

3. The enclosing belt of highland that forms the water-parting is much higher in the west and the east than in the north and the south.

- (1) The southern highlands are much higher than the northern, but in both places the actual water-parting is extremely slight. Tributaries to the Zambesi or the inland drainage area of Lake Ngami rise quite close to, but *north* of, tributaries of the Congo; and tributaries to the Nile or the inland drainage area of Lake Chad rise quite close to, but *south* of, tributaries of the Congo.
- (2) On the east the enclosing highlands form the western edge of the Great Eastern Plateau, while in the west they rise to a height of 6500 feet in the Bihé plateau.
- (3) This Bihé plateau is marked by parallel ridges of mountains, which make communication with the sea very difficult; the rivers are, except the Kwanza, absolutely useless for navigation owing to rapids, and the gradients are very trying for railways.

4. The Congo basin is the largest and much the most important area of low land in Africa, being the dried up bed of an inland sea, which must have been at least half the size of the Mediterranean.

- (1) The lowest part of this area lies between 5° S. and 5° N., where the low elevation, the equatorial heat, and the abundance of water, produce dense tropical vegetation and an almost impossible climate.

N.B.—Out of every *ten* European officials in the Congo State, *nine* die or are invalided home within three years.

- (2) On either side of this area of equatorial rainfall and unvarying temperature, the elevation rises, and the rainfall decreases; and, as the forest consequently becomes much thinner, the climate improves both for man and beast.

- (3) The vile climate, the labyrinth of waterways, and the dense forests, make this area extremely difficult to govern; and the difficulty is increased by the absence of a common native language. The unfavourable conditions of forest life have also produced a most degraded type of people, dwarfish in stature and treacherous in conduct.

Lesson 23. The 'Congo' States.

1. The 'Congo' States include the German Kamerun, the French Congo, and the Congo Free State, the latter being much the most important.

- (1) The Congo Government professes to have restricted the liquor traffic, checked cannibalism, suppressed inter-tribal massacres, greatly impeded the slave-trade, and introduced regular work and education; but it is a commercial failure, mainly because it has been administered with too direct a view to profits.

2. The Kamerun district consists of a coastal area of dense forest and a fertile open plateau inland.

- (1) In addition to the dense forest and the hostility of the natives, communication inland has been made very difficult by the fact that all the rivers are ruined for navigation by rapids; and European settlement costs too many lives, even the Kamerun peak (13,000 feet) being haunted with malarial fever.
- (2) The climate and the volcanic soil produce, however, most luxuriant vegetation, the oil-palm and rubber-creepers being the chief natural products; and cacao and coffee have been planted with great success, *e.g.* between Batanga and Yaunde.
- (3) The Adamawa district is famous for ivory, its forest-grown tusks being much more perfect and less brittle than those grown in open country; but the product

is exported mainly *via* the Benué or the Saharan caravans.

- (4) The trade of the country is done almost entirely through Victoria, on the fine natural harbour of Amba Bay, the site of an old British Mission.
- (5) The name of the country, as of the volcanic peak is derived from a tidal estuary which the early Portuguese explorers christened Rio dos Camerones, 'The River of Shrimps.'

3. The French Congo is joined, *via* the Upper Ubangi and the Bagirmi district, to Lake Chad and the French Sudan.

- (1) Libreville is the capital, and has a fine harbour on Gabon Bay; but the best routes inland are *via* the Ogowe and the Kwilu rivers, and the latter makes Loango a more important harbour than Libreville.
- (2) All the inland towns of any importance are along the river valleys, *e.g.* Lambarene, Bué, Franceville, and Brazzaville; and, therefore, they are all centres for collecting palm-oil, rubber, and various dye-woods.
- (3) The chief centres towards the Sudan are Yagusu, Mbanga, and Abu Gher, which export ivory and ostrich feathers, *via* the Sahara.

N.B.—The strip of Spanish territory round Corisco Bay is quite unimportant.

4. The Congo Free State is at present more interesting politically than commercially.

- (1) Until 1877 it was an entirely unknown land, and in 1884 it was a fully organised State, with an area of nearly 900,000 square miles.

5. It has, however, enormous natural supplies of vegetable wealth; and, outside the forest area, its climate and soil offer every inducement to cultivation.

- (1) The vegetable wealth at present consists mainly in oil-palms, rubber-creepers, and orchilla.

- (2) Coffee cultivation has already proved successful; and the Bantu inhabitants are naturally tillers of the soil, and cultivate the natural products of the area—bananas, manioc, and cereals.
- (3) The forest area has been so recently opened up that it still produces abundance of ivory.

6. The development of the country depends almost entirely on the waterways; and, therefore, the most important centres are on the great arteries.

- (1) The most important is the harbour of Leopoldville on Stanley Pool, where all these arteries meet; and next in importance come New Antwerp or Bangala (= Liboko), on the great north-west bend of the main stream, and Kibonge, Nyangwe, and Kasongo, on the Upper Congo.
- (2) The most important tributary is the Kassai, partly because it gives such direct access, *via* its Sankurn tributary, to the head waters of the main stream, and partly because it drains the rich alluvial plain south of the line of rapids (cf. p. 18). Its chief centre is Luluaburg.
- (3) In the extreme south-east there is the important copper region of Katanga; and in the extreme north-east King Leopold leases an important political area along the Nile, including Wadelai, Dufie, and Lado.

7. The development of the waterways depends in turn on access from the sea.

- (1) The Congo is navigable for the largest merchant vessels from the out-port of Banana up to the in-port (and capital) of Boma; and large vessels can reach Vivi.
- (2) Between Vivi and Stanley Pool navigation is absolutely impossible; and, therefore, a railway has been built from Matadi to Dolo (= Kinshasa).

Lesson 24. Angola.

1. Angola is the name now given to all the Portuguese possessions in West Central Africa.

- (1) The old territory of Angola was simply the coast between the Dande and the Kwanza, with the accompanying Hinterland.
- (2) The other old provinces now included under the general name of Angola are Loanda, Benguela, and Mossamedes.
- (3) There are also two new territories included under the term—Ambriz and Portuguese Congo.

2. The surface is exceedingly uneven, and most of it is at a considerable elevation.

- (1) The northern part, between the Congo and Kwanza, is fully 3000 feet high throughout almost the entire distance from the coast to the Kwango.
- (2) The southern part, between the Kwanza and the Kunene, is even higher, attaining in the Bihé Mountains a height of fully 6500 feet.
- (3) In both areas the surface is ridged with parallel mountain ranges running from north to south; and in both the plateau falls in a single steep slope to the Congo, but in three terraces to the Atlantic.

3. This arrangement obviously ruins the rivers for navigation; and no roads have been made to supply the want of waterways.

- (1) The Kwanza, though not so long as the Kunene, is the only navigable river, having continuous navigation for small steamers up to Dondo (about 125 miles from Loanda); but the volume of water is very variable, and a company has a monopoly of the traffic.

4. For this variable volume the climate is responsible,—the variation of temperature increasing

with the distance from the Equator and from the sea, while the rainfall decreases from north to south.

- (1) The Congo districts, both north and south of the river, are very warm and damp, and therefore covered with dense forest ; and the climate is deadly.
- (2) Up on the Bihé plateau the temperature ranges from 86° to below freezing point, and the climate is quite healthy for Europeans, *e.g.* at Humpata, Huilla, and Sa du Bandeira.
- (3) As the regular winds in the latitude of Angola are S.E. Trades blowing seaward, the humidity cannot be measured by the rainfall—at least, on the coast. For instance, at Loanda, the rainfall is scarcely 6 inches a year, and yet the sky is generally covered with clouds for 350 out of the 365 days in the year.

N.B.—Even at San Salvador, where the plateau is quite high enough to make a fairly good condensing medium, the rainfall is only 35 inches a year.

5. Under such circumstances the natural products are entirely 'tropical,' *e.g.* oil-palms, rubber-creepers, coffee, cotton, sugar-cane ; but only two, the coffee and the sugar-cane, have hitherto been cultivated.

- (1) The coffee grows wild over all the northern area, especially in the Kwango and Kwanza basins ; and it is cultivated in the Encoje district, in Cazengo and Golungo Alto. The great hindrance to the development of the industry is the cost of human portorage to Dondo. When the railway is extended from Ambaca to Malanje, the healthier plateau between Cazengo and Cassanje will certainly be planted.
- (2) The sugar is mostly grown for the distillation of rum, for which the excessive humidity is very favourable—the proportion of molasses made in crystallising 1 cwt. of sugar varying with the humidity from 50 to 90 gallons, which produce an equal number of gallons of proof rum. The cane, of course, requires more heat

and moisture and a lower elevation than the coffee, and is grown mainly along the coast and on the right bank of the Kwanza below Dondo.

- (3) In the drier and higher south there is excellent cattle-pasture, for the rivers are subject to regular floods, which cover their banks with rich mud; and in the lower reaches of the Kunene the mud grows good cotton.

6. In addition to the extreme fertility of the soil, there is also undoubted mineral wealth; but it is still undeveloped, mainly owing to expense of working.

- (1) Iron has been worked from time immemorial by the natives of Cazengo; gold is known to exist in the Kwanza basin, and copper in the Loge basin.

7. There are five chief outlets for the produce of Angola—the Congo, Ambriz, Loanda, Benguela, and Mossamedes.

- (1) Mossamedes exports the cattle and other wealth of the European settlers in the Kunene basin—guano and nitrate of soda from the semi-desert strip immediately behind the town—and several thousand tons of fish, which are brought to the excellent harbour of Little Fish Bay by the cold Benguela Current.
- (2) Benguela has only an open roadstead, but is the terminus of a good route to the fertile and healthy Bihé plateau. Its principal exports at present are simply the spontaneous products of the coast, *e.g.* india-rubber and wax.
- (3) Ambriz, like Benguela, is an open roadstead which would be useless except for the fact that tempests are very rare. It owes its importance entirely to its good route up the Loge Valley to the coffee plantations of Encoje.
- (4) The 'Congo' ports naturally export palm-oil, rubber, and ivory from the lowlands of San Salvador, Cazengo,

and Cabinda, mainly from the ports of Landana, Cabinda, and Ambrizette.

- (5) Loanda is the natural capital. It is much the best harbour on the whole coast, being protected from the ocean swell and the dangerous winds (S.W.) by a small island ; it commands both the railway route to Malanje, *via* Ambaca, and the river route, *via* Dondo ; and the coffee of the Kwanza valley is at present the only important cultivated product of the country.

THE ZAMBESI REGION.

Lesson 25. Physical Features.

1. The Zambesi Region is simply a continuation of the Great Eastern Plateau, and includes part of that area already noticed; but the characteristic features are all on a smaller scale.

- (1) The lake formation is still of two kinds—the shallow, circular kind, *e.g.* Lake Mweru and Lake Bangweolo, and the deep, elongated kind, *e.g.* Lake Nyasa and the old lake-bed of the Loangwa Valley.
- (2) The eastern buttress is still the higher and much the steeper, rising in Mount Mlanji to nearly 10,000 feet, while the Congo-Zambesi water-parting in the west can be scarcely distinguished by the eye from the uniform surface of the plateau.
- (3) The wet winds still come from the east, and the shorter distance from the sea compensates for the lower elevation of the mountains for condensing purposes.

2. The general slope of the plateau is marked by the general trend of the rivers and by the vagueness of the water-parting.

- (1) It is so level in the west that branches of the Kwando seem to drain indifferently into Lake Ngami or the Zambesi, as streams between Lake Mweru and Lake Bangweolo drain indifferently into the Congo or the Zambesi.
- (2) All the main tributaries, *e.g.* the Kafue and the Loangwa, the Sanyati and the Panyami, have a distinct westward trend for a large part of their course; and even the main stream, under the name of the Liba, at first flows westward.

- (3) In the east not only is the surface broken by numerous isolated hills or 'kopjes,' but there is a definite mountain system running north and south (cf. the Matoppo Hills).

3. The Zambesi itself may be naturally divided into three portions of distinctly different level.

- (1) The Upper Valley ends at the Victoria Falls. Above the falls there is a magnificent waterway, especially after the confluence of the Kwando and on the 'Liambai' portion of the river; but navigation is completely stopped by the Gonyé Falls.
- (2) The Central Valley, between the Victoria Falls and the Kebra-basa Rapids, is less useful than the upper one, mainly owing to the pace of the tributaries from the high escarpment on each side, and to the number of rapids which become unnavigable at low water. It is also the area most infested with the dreaded tsetse fly.

N.B.—This pest is harmless to men, but fatal to horses and cattle, and has therefore encouraged the slave-trade; but it has disappeared elsewhere in Africa with the disappearance of big game, and may do so here.

- (3) The lower reach of the river from the Kebra-basa Rapids to the sea is a fairly good waterway, but the low level and the abundance of alluvium cause it to be obstructed by shifting sand-banks—the residue going to make the deadly delta. This section is, however, the most important because it receives the great Shiré tributary, which is itself navigable up to Lake Nyasa except for one series of rapids. It also contains the important Portuguese stations of Sena, Tete, and Zumbo.

N.B.—The Chindé is the only really useful passage through the delta, but it is very unhealthy and simply alive with mosquitoes.

4. The coast-land is naturally divided by the Zambesi into two dissimilar areas.

- (1) The northern area is much the broader and the higher; it is broken by steep hills and mountain ridges; and it is crossed by rapid shallow streams, *e.g.* the Lurio.
- (2) The southern area has a more or less uniform low level, which greatly affects the character of the rivers, *e.g.* the Pungwe, the Sabi, and the Lower Limpopo—the Pungwe providing much the easiest access to the Mashona plateau.
- (3) These lowlands have, of course, much more luxuriant vegetation than the dry elevated plateau behind them, which in the south-west becomes mere arid steppe; but their latitude puts them beyond the influence of the Equatorial rainfall, and therefore the jungle is nowhere very dense.

Lesson 26. Political Divisions (1).

1. Most of the coast-land does not strictly belong to the Zambesi basin, but it has a political unity—belonging entirely to Portugal.

- (1) Like the corresponding long strip of Angola, it has been utterly neglected by the Portuguese; and all its old centres are being replaced by new ones that are being developed by the transit trade to British Central Africa. Thus Quilimane is being replaced by Chindé, Sofala by Beira, and Inhambane—except for rubber—by Lourenço Marques.
- (2) Mozambique is the most important town in the north, and gives its name to the whole province north of the Zambesi. Like so many African ports, it is on an island; and the island shelters the harbour of Mosuril Bay (*cf.* Mombasa). Besides its through trade to British Central Africa, it collects oil, rubber, copra, wax, etc., from little neighbouring ports, *e.g.* Ibo.
- (3) Lourenço Marques, which gives its name to the whole province south of the Zambesi, has a magnificent

harbour on Delagoa Bay, sheltered by a tongue of land from the S.E. gales, and with easy access to the Transvaal; and it is the terminus of the most important railway in East Africa. Beira also owes its importance to its easy access inland by rail—up the Pungwe valley to the Mashona gold-fields, *via* Untali.

N.B.—Lourenço Marques is extremely unhealthy, being built in the middle of a swamp.

2. British Central Africa has been developed from the natural sanatorium of the Nyasa highlands, *via* the Shiré River southwards and the Stevenson Road northwards.

- (1) The Stevenson Road was the natural result of Dr. Livingstone's work, but the whole expense of it from Lake Nyasa to Lake Tanganyika was defrayed by Mr. James Stevenson; and it is quite good enough for bicycle traffic.
- (2) The earliest settlement was at Blantyre, but the capital is now Zomba; and outposts have been developed at the various extremities of the Protectorate, *e.g.* Rhodesia on Lake Mweru, and Fort Rosebery on the Luapula river.
- (3) The native trade in spontaneous products, especially the ivory of Kambombo and Seuga and the rubber of Bandawe, has been developed, and various tropical and semi-tropical plants have been cultivated, *e.g.* sugar and cotton; but the staple product is coffee.

3. Nyasaland produces the best coffee in the market, but the area for it is limited.

- (1) In most parts the plant is not flourishing, owing to the absence of trees to shade the young shrubs, and to the fact that the rain falls at the wrong time. Moreover, the demand for labour on the plantations attracts the natives from portage, and yet cartage is impossible through the tsetse-fly district.

- (2) The Bandawe coffee is, however, the best in the world; there is abundance of shade between Mount Kowirwi and Lake Nyasa, the average rainfall is about 7 feet and well distributed throughout the year, and the rich fibrous soil is exactly suited to the plant. There is also a first-rate harbour close at hand in Nkata Bay.
- (3) Even in the Bandawe district, however, there is great need of a railway to get the coffee out of the country before the rains, which have spoilt many a fine crop.

Lesson 27. Political Divisions (2).

1. Rhodesia is the unofficial name usually given to the important Matabili and Mashona plateaus which form Southern Zambesia.

- (1) The importance of this area is due mainly to the fact that its height and its latitude make it more suitable for Europeans than any other equal area of tropical Africa.

2. The surface is mainly one continuous plateau ridged by the Matoppo and the Umvukwe Mountains, and rising towards the east.

- (1) The natural slope makes the plateau fall much more steeply towards the sea than inland; and, as the seaward face, of course, also gets the heaviest rains, the deep eastern valleys, *e.g.* those of the Mazoe and the Sabi, are covered with very fertile alluvium washed down from the steep escarpment.
- (2) The gentle westward slope ends towards both the Zambesi and the Limpopo in low veld, which is magnificent natural pasture, though the presence of the tsetse-fly makes the Zambesi veld useless in the meantime.

- (3) The rest of the country is between 4000 and 5000 feet above the sea, which makes it particularly healthy, and is well watered, fertile, and rich in minerals.

3. The wealth of the area lies at present mainly in grain and gold.

- (1) The rich alluvial valleys along the eastern escarpment produce wonderful crops of all kinds of tropical plants, especially rice, sugar, and cotton; but the staple products of the country are maize and Kaffir corn.
- (2) The presence of hemp and tobacco, as well as the cotton, growing wild, *e.g.* in the Hanyani, Umquadzi, and Mazoe valleys, proves that both soil and climate must be admirably adapted to fibres; and, as the country is being developed mainly by a mining population, the tobacco will probably become extremely important.

N.B.—The natives smoke the hemp as well as the tobacco, but hemp-smoking causes certain death within quite a few years.

- (3) The watershed is mainly granite, but is intersected by areas of the best possible formation for gold, *i.e.* quartz and blue slate; the chief rivers have abundance of water, and the 'mopani' bush provides sufficient timber for successful mining; and there is good transport by rail *via* Bulawayo and the Cape, and *via* Umtali and Beira.

4. The Mashona plateau is rather the higher, healthier, more fertile, better watered, and richer in minerals; and its natives are distinctly the more peaceful and industrious.

- (1) The Matabili are savage warriors who did not allow any real prospecting for gold, and who drove the Mashonas up into the lonely valleys of the north-east, where they could build cities of refuge on impregnable peaks of granite.
- (2) The Mashonas are peaceful to cowardice, and have worked both the mineral and the agricultural wealth.

For instance, they manufactured at Mchesa the excellent hematite iron found in the Umquadzi valley ; they wove 'blankets' out of the wild cotton, and dyed them with the wild indigo ; they even made string out of one kind of bark, and mixed another kind with saltpetre to make a poor sort of gunpowder.

5. The towns are almost entirely centres of mineral wealth.

- (1) The two great political centres are Bulawayo and Salisbury, at opposite ends of the water-parting ; the other towns are along the great road from Bechuanaland to Salisbury, *e.g.* Macloutsie, Tuli, Victoria, Charter, and Hartley Hill.

N.B.—The ruins of Zimbabwe are probably of Persian origin, but the wide-spread traces of old gold-workings have caused them to be identified with the Ophir of King Solomon.

CALMS OF CAPRICORN.

Lesson 28. Damaraland.

1. The Calms of Capricorn, like the Calms of Cancer, are marked by a stretch of desert.

- (1) The Kalahari desert, like the Sahara, is caused entirely by the absence of rain ; and its sandy surface, like that of the Sahara, is due to the disintegrating force of the great changes of temperature from day to night.
- (2) It is comparatively small, because the breadth of Africa at the South Tropic is not much more than one-third of its breadth at the North Tropic ; but it extends actually over an area as large as England, and its influence is practically felt from Lake Ngami to the Orange River, and from Palapye to Walvisch Bay.
- (3) Like the Sahara, it merges towards the Equator in an area of inland drainage, which is connected with a series of salt pans ; and Lake Ngami, like Lake Chad, is fed by a stream which flows from the moister regions nearer the Equator.
- (4) Like the Sahara, it extends westward in desert or semi-desert form to the very shore of the Atlantic ; but the Limpopo, like the Nile, wins from the desert its own valley in the east.
- (5) On the other hand, the Kalahari desert is not only much smaller, but also distinctly less arid, than the Sahara ; it has larger supplies of subterranean water, and is widely covered with coarse grass between the stretches of sand.

2. The whole area between the Limpopo and the sea is divided between Britain and Germany.

- (1) The most important part of the German territory is the strip through the British territory by which Damaraland has access to the Zambesi.
- (2) The most important part of the British territory is the hinterland of Walvisch Bay, which completely dominates the trade of German South-West Africa.

3. German South-West Africa consists of a series of terraces rising eastward into a definite mountain range.

- (1) The highest summit, Mount Omutako, is about 7500 feet high; and the considerable average height of the whole country gives it more rain (about 18 inches a year) than might be expected in such a latitude off the cold Benguela current.
- (2) The rainfall is, however, practically too small everywhere for agriculture, though the Damara highlands encroach on the moister regions of constant equatorial rainfall; and, therefore, cattle-rearing is the only hopeful industry except the copper-mining in Great Namaqualand.
- (3) Thanks to its central position, the fairly permanent volume of the Swakop River, and the command of the trade-routes converging on Walvisch Bay, Otyimbingue has been made the political centre; missionaries have established stations all over the healthy highlands, *e.g.* Rehoboth, Beersheba, Bethany; and an attempt has been made to develop the harbours of Sandwich and Angra Pequena (= Luderiz Bay).
- (4) Walvisch Bay is, however, the only good harbour, and commands all the best routes into the interior—up the two watercourses of the Swakop and the Kuisip. Moreover, as the distance from the Bay to Vryburg is less than 800 miles, a railway between the two places *via* Sandfontein would save two days' journey by sea and one day's journey by rail over the present Cape route to the Witwatersrand goldfield.

- (5) The use to Britain of such an isolated settlement—no larger than Berwickshire or Bedfordshire—is comparatively so small, and the possession of it so essential to Germany, that it will probably be exchanged for some portion of German territory elsewhere in Africa. The most useful portion to Britain would be a strip along the north-west corner of German East Africa, which would bring the Uganda boundary to the north end of Lake Tanganyika.

Lesson 29. Bechuanaland.

1. The importance of Bechuanaland is due to the fact that it contains part of the great trans-continental route from north to south along the Eastern Plateau.

- (1) This communication is made exceptionally easy by the level surface and by the artificial character of the boundaries ; but, though the latter present no physical obstacle to commerce, the Orange, the Limpopo, and the Marico rivers form very convenient political boundaries.
- (2) The Molopo performs a similar service between the old Crown Colony, or British Bechuanaland, in the south and the Protectorate in the north.

2. British Bechuanaland is a fine plateau about the size of England, rising to a height of 5000 feet.

- (1). This height and the dry air make it very healthy ; and, as there is also excellent pasture, the plateau forms an important basis for the British position northwards to the Zambesi.
- (2) Politically, it is now part of Cape Colony ; but, geographically, it has more in common with the Bechu-

analand Protectorate, and falls naturally under the area of the Capricorn Calms.

3. The country is divided into two unequal parts by the line of hills which run due north from Kheis to the Molopo.

- (1) West of the hills the land is a waste, forming part of the Kalahari desert; it has no rain except during occasional thunderstorms; and its vegetation is largely limited to plants with deep tuberous roots, in which they can store up the little rain that does fall. (Cf. p. 31.)
- (2) The eastern part is also very dry; but the soil is naturally fertile, the summer rains (25 inches) might be stored, and irrigation produces very large crops of maize and millet, especially in the Hart basin.
- (3) The political capital is Vryburg; but both Taungs and Mafeking are more important, as they have the advantage of rivers—the Hart and the Molopo—as well as the railway. Taungs trades (in maize, wool, hides, cattle, etc.) with Kimberley; and Mafeking, which is the largest town, controls the trade with the Protectorate and the Transvaal.

N.B.—The only town of any size away from this eastern border is Kuruman, which collects salt from the desert. Cf. Tandeni in the Sahara.

4. The Protectorate, like the Colony, is divided into two unequal parts by a continuation northwards of the same line of hills.

- (1) West of the hills stretches the Kalahari desert, in which the bushmen manage to keep herds of native sheep and goats. There is also some mineral wealth, including salt and gold.
- (2) Eastward the country gradually changes from desert into valuable pasture, *e.g.* between Molepolole and Palapye, and then into valuable agricultural land, *e.g.* between the Notwani and Limpopo rivers, where there are special facilities for irrigation,

- (3) There are only two towns of importance, the frontier market of Kanya and the political centre of Palapye. The latter, King Khama's capital, is quite a new town, but has a population of over 30,000. Shoshong used to be the capital, but in 1889 Khama transferred his town bodily to the healthier site of Palapye, where both the air and the water are of the purest, and where the porous sand and the dry air materially assist sanitation.

Lesson 30. The Dutch Republics.

1. The Dutch Republics consist of a broad high plateau, with an undulating surface, entirely cut off from the sea by the Draken-Berge.

- (1) The plateau is known as the Veld ; the soil is generally sandy, the surface is grassy, and the climate is extremely healthy.
- (2) Two-thirds of the whole area is occupied by the Transvaal, which is about the same size as the United Kingdom, while the Orange Free State is about the size of England alone.
- (3) Though most of the area falls within the belt of Capricorn Calms, its nearness to the ocean and the height of the Draken-Berge give it a far better water supply than Bechuanaland.

2. The Transvaal is naturally divided into three areas—the High, the Middle, and the Low Veld.

- (1) The High, or Hooge, Veld is an area, about the size of Ireland, between the Vaal River and the Magalies Mountains ; it is destitute of trees, and very dry during the winter months ; but it is wonderfully bracing and healthy, and has splendid sheep pasture. It is also extremely rich in gold.
- (2) The Middle Veld, or 'Garden of the Transvaal,' is a rather smaller area of lower elevation, crossed by

detached ranges, *e.g.* Waterberg and Hanglip, broken by wooded 'kloofs' or gulleys, and drained by the headwaters both of the Limpopo and of the Olifant.

- (3) The Low, or Bosch (Bush), Veld averages nearly 2000 feet lower than the Middle Veld; and, as it is also much better watered than the rest of the country, it is densely forested. This makes it distinctly unhealthy; and, as the bush is haunted by the tsetse fly, stock-rearing is impossible.

3. The occupations of the people vary with nationality and with the different Velds.

- (1) On the High Veld the Dutch are almost entirely occupied with sheep and horse farming; on the Middle Veld they raise cattle and grain, especially maize (mealies); and in the Bush Veld they are mainly engaged in planting coffee and sugar-cane.

N.B.—Swaziland may be reckoned as a Middle Veld region.

- (2) The various foreigners, mainly British, were attracted to the country by its mineral wealth, which is largely confined to the High Veld. Coal exists in considerable quantities, *e.g.* round Boksburg, and is very useful in the almost complete absence of timber; but gold is the great staple—nearly £11,000,000 worth having been produced in 1897.
- (3) The richest gold-fields lie along the Witwatersrand, *i.e.* the hilly ridge which divides the Orange basin from that of the Limpopo; and the great centre is Johannesburg, which since 1885 has sprung up into a city of 100,000 inhabitants. There are also rich fields amongst the Draken-Berge valleys, *e.g.* the De Kaap, on which the towns of Barberton and Lydenburg have sprung up.

4. The towns, therefore, are of two kinds—mining and farming.

- (1) The political centres are generally little pastoral towns on the High Veld, like the old and present capitals of

Potchefstroom and Pretoria ; the centres of mixed farming are even smaller and generally on the Middle Veld, *e.g.* Rustenburg and Nylstroom, Utrecht and Vryheid ; the plantation settlements are entirely in the low land north of the Tropic, *e.g.* Valdesia.

- (2) The mining and railway centres, on the other hand, are already big cities or rapidly becoming so, *e.g.* Heidelberg and Middleburg, Leydsdorp and Krugersdorp, Komati Poort and Elandsfontein.
- (3) The commercial capital is Johannesburg, which has direct connection by rail with five different railway termini round the South African coast—Cape Town (about 1000 miles), Port Elizabeth (about 700), East London (665), Durban (437), and Lourenço-Marques (about 400).

N.B.—All these railways have a common trunk, the eleven miles of rail between Johannesburg and Elandsfontein, which is the only double line of rails in the country.

5. The Orange Free State is almost a dead level, broken only by kopjes in the south, and it is entirely pastoral and mining.

- (1) The dry air and want of water, which practically prohibit agriculture, make the climate exceedingly healthy, especially for persons with weak lungs ; and, for the same reason, the country produces magnificent wool and ostrich-feathers.
- (2) There is also considerable mineral wealth, including diamonds to the west of Fauresmith and coal between Kroonstad and Heilbron.
- (3) The chief centres of population are Bloemfontein, the capital, and Winburg, both on the main line north from Port Elizabeth and East London to Johannesburg ; Harrismith is an important frontier junction on a branch of the main line from Durban to Johannesburg ; and Ladybrand and Smithfield are cattle-markets amongst the rich pastures of the Caledon valley.

BRITISH SOUTH AFRICA.

Lesson 31. Cape Colony (Physical).

1. Cape Colony is of immense value to the British Empire, because it commands the most important trade-route in the water hemisphere.

- (1) Cape Town is the only harbour of real importance between St. Helena and Mauritius for India-bound vessels, and between St. Helena and Albany for vessels in the Australasian trade.
- (2) It is, therefore, the only convenient coaling-station for vessels before they enter the latitudes of 'The Roaring Forties.'
- (3) These two facts make the possession of Cape Town a sheer necessity for an empire which has the greatest navy in the world, and the security of which depends on its naval supremacy.

2. Cape Colony is three times as large as Great Britain, but has not as much coast as England alone; and very few of the existing harbours are naturally good.

- (1) The reason for this is the immense amount of alluvium brought down by the great rivers of the continent, and distributed by various currents along the coast.
- (2) The best natural harbour is Saldanha Bay, about 60 miles north of Cape Town; but, as it has neither supplies of fresh water nor communication inland, it has no value except as a refuge.
- (3) Table Bay is exposed towards the north-west, and is therefore not quite safe during 'Anti-Trade' gales; but it is of so much importance to the British mercantile marine that extensive harbour works have been constructed, and it has good communication inland.

- (4) Simon's Bay, by which also there is a good approach to Cape Town, is large and sheltered; but the entrance is dangerous, because Cape Agulhas extends a long way seaward beneath the surface of the water, strong currents sweep round the Cape, and the meeting of the cold Benguela current with the warm Mozambique current causes dense fogs.
- (5) The best harbour on the rest of the Cape coast is Algoa Bay; but even that is exposed towards the south-east, the stormy quarter, and does not admit the largest vessels to Port Elizabeth. East London, Port Alfred, and Mossel Bay are simply roadsteads.

3. Cape Colony is of typical African formation—a large plateau rising abruptly in parallel terraces from a moist coast-strip to dry flat-topped mountains like Table Mountain.

- (1) These so-called mountains are really the steep escarpment of the plateau, and run from east to west across the Colony.
- (2) The lowest terrace is very near the sea in the west and south, but towards the east retreats from 20 to 60 miles.
- (3) The third terrace leads to a plateau nearly half the size of England, called the Great Karroo—from the Hottentot name for a shrub that grows on it; and, as the average elevation of it is 3000 feet, the rainfall is too slight for anything except sheep pasture.

4. The Nieuwveld Mountains, a continuation westwards of the Draken-Berge, form the water-parting of the country.

- (1) The rivers that flow northward from them are fed mainly by thunder-rain; and they are, therefore, very variable in volume. Cf. the Orange.
- (2) The southward rivers, *e.g.* the Gauritz, Gamtoos, and Sunday, vary much less, and might be very useful

for irrigation ; but the sudden and violent floods to which they are subject, cause them to plough such deep channels that irrigation by gravitation—the only cheap method—is practically impossible.

- (3) The range rises in height (under different names—Winter-Berge, Sneeuw-Berge, and Storm-Berge) towards the east ; and this increase in height is accompanied by an increase in the amount of vapour brought landwards—off the warm Mozambique current. Consequently, the rivers, *e.g.* the Great Fish River, begin to have more permanent volume.

5. The climate naturally changes with the height and the distance from the sea, and changes still more importantly with the longitude.

- (1) The rains in the east fall in summer, while those in the west fall in winter ; and, therefore, *e.g.* at Grahamstown, the rain cools the heated air, and the clouds temper the sun's rays.
- (2) The damp heat of the south-east coast, *e.g.* at Port Elizabeth and East London, is as bad for Europeans as the consequent sour grass is for stock ; but the pure dry air of the inland heights, *e.g.* at Colesberg and Aliwal North, is magnificently healthy.
- (3) The cold Benguela current affects the climate unpleasantly in the west, and decreases the rainfall ; and, therefore, most of the towns are in the south-east, where the rainfall is sufficient for general agriculture.
- (4) The actual rainfall varies from about 40 inches at Grahamstown to about 5 in the north-west of the Great Karroo ; but there is a local rainfall of 30 inches at Cape Town owing to the height of the condensing medium (Table Mountain=3600 feet) and its nearness to the sea.
- (5) In connection with this rainfall there is an extensive and valuable salt industry. Cf. the salt-pans in the Sahara and the Kalahari deserts.

Lesson 32. Cape Colony (Commercial).

1. With such a scanty rainfall, it is obvious that agriculture must be extremely limited.

- (1) The average rainfall over the rich wheat lands in the Eastern Counties of England is not more than 30 inches; but on a plateau in the latitude of Cape Colony, where both filtration and evaporation are very rapid, 60 inches would not be too much.
- (2) Even in the districts which have the heaviest rainfall, irrigation is a necessity; and this is rendered difficult and expensive by the depth of the river-beds.
- (3) Wheat and maize are the only grain-crops, the wheat being naturally grown in the drier and colder south-west, while the maize is grown in the damper and hotter south-east. The best wheat comes from the Malmesbury plain; most of the maize, or 'mealies,' comes from the district between Uitenhage and King (William's Town).
- (4) The vine is, however, eminently adapted to such a dry climate, and is said to grow more luxuriantly in the south-west than in any other part of the world. The most productive vineyards are on the warm, dry slopes of the lowest terrace, *e.g.* at Paarl, Stellenbosch, Constantia, and Wynberg ('wineburg'). The proximity of these places to Cape Town, the ease with which cork-dust can be imported from Lisbon, and the nearness of Cape Town itself to London, have caused a large export of grapes. Cf. p. 103.
- (5) Tobacco also grows well in the south, especially in the rich limestone valley of Oudtshoorn, where the shelter of the Zwarte-Berge and the Lange-Berge on the north and the south, the number of streams, the proximity to the sea, and the presence of extensive forests between the Lange-Berge and the sea, seem to guarantee permanent success to the planters.

N.B.—In such a treeless country these forests are specially valuable, and supply wood for wagon-building.

2. The pastoral wealth is much greater, therefore, than the agricultural, and is mainly in sheep and goats.

- (1) The coast-lands, however, are suitable for cattle, especially in Transkei and Pondoland ; and there is a large demand for transport oxen for the wagon-traffic over the roadless plains of the interior.
- (2) The goats are much more numerous than the cattle, and are of two kinds—native and Angora. The former are very hardy, but the latter are much the more valuable. Most of them are kept on the Upper Karroo and the eastern half of the Great Karroo, especially round Richmond and Graaf Reinet ; and mohair to the value of £500,000 is exported annually *via* Port Elizabeth.
- (3) The sheep, like the goats, are of two kinds—native and Merino ; and in the very dry north-west the native is even preferred. Elsewhere the Merino is the most valuable animal in the country, and wool is exported to the value of about £2,500,000. The most important sheep farms are also on the Great Karroo, and there is great mortality amongst the sheep in a dry season ; but this is mainly due to bad farming—*e.g.* overstocking the land, keeping the kraals dirty, or wearing out large areas of good pasture by always bringing the sheep to the same kraal by exactly the same route.
- (4) Ostrich-farming requires special knowledge and experience ; and, as profits are peculiarly dependent on the caprices of fashion, only wealthy capitalists can risk the possible heavy losses or the long waiting for gains. The centres of the industry are Uitenhage and Grahamstown.

3. The scarcity of fuel, which will probably prevent the Colony ever having any important manufacturing industries except tanning, has also hindered the development of the mineral wealth.

- (1) Coal does exist in considerable quantities in the Storm-Berge, *e.g.* at Molteno and Cyphergat, and can be easily *quarried* out of the hillsides ; but it is of very poor quality.
 - (2) Copper is also found in various parts, and exists in valuable quantities in the old rock of Namaqualand. The richest deposits are at Ookiep, which is connected by a tramway with the roadstead of Nolloth.
 - (3) Diamonds are, however, the great mineral product, and realize more than £4,000,000 a year. The chief mines are in the blue clay of Griqualand West, where archaic and mesozoic formations meet in the valley of the Vaal. Kimberley is the centre of the industry, and lies in the natural Line of Least Resistance for the transcontinental railway traffic.
4. The other important towns of the Colony are generally stations on the great trunk lines, which run from the various ports to the diamond and gold fields of the north.
- (1) In the North-Eastern Province, where all these lines converge, De Aar, Naauw Poort, Middleburg, and Cradock are all important junctions ; the lines of the Cape Town district converge on Worcester, as those of Port Elizabeth and Port Alfred converge on Alice-dale ; and Tulbagh, Beaufort West, and Cathcart command various passes by which the railways climb the terraces.

Lesson 33. Natal and Basutoland.

1. Natal is two-thirds the size of Scotland, but it has only 200 miles of coast and only one good harbour—on Port Natal.
- (1) This bay, however, is by no means an ideal harbour, as it has a shifting bar and is quite shallow ; but, as it is the best harbour on the coast, it monopolises

the trade of Natal, and does a large share of the Free State and Transvaal trade. Durban itself is well sheltered by a spur of land that juts out south-eastward into the bay.

2. The western boundary is the natural obstacle of the Draken-Berge, which vary from 6000 to 10,000 feet in height.

- (1) The passes across the range, though few and steep, have therefore become very important. The Van Reenens Pass gives railway access to the Orange Free State, and the pass below Majuba Hill gives railway access to the Transvaal; and there is, fortunately, a valuable coalfield between the two along the Natal slope of the Draken-Berge.

3. The surface both of Natal proper and of Zululand, like that of Cape Colony, rises in steep terraces.

- (1) The lowest terrace makes Pietermaritzburg 2000 feet higher than Durban, and the highest terrace provides the Tugela River with a waterfall of 2000 feet (in three plunges).
- (2) The height of this innermost terrace, which is practically the Draken-Berge, and its nearness to the warm Mozambique current, guarantee much more rain than in Cape Colony. Even at Ladysmith, which is 100 miles from the sea, there are at least 24 inches annually.
- (3) The steepness and the frequency of the terraces, though they make continuous navigation impossible even on the Tugela, offer special facilities for motive power and irrigation.

4. The climate is not nearly so healthy as in Cape Colony; the heat is great, especially in Zululand, and the rain comes mainly in the hottest season.

- (1) The smaller rainfall in winter is usually sufficient, as the sun's heat is less ; and the summer storms bring with them densely-clouded skies, which shade young plants from the sunshine.
- (2) The torrential character of the rains, however, has cut up the surface, as in Cape Colony, with deep 'kloofs' ; but, as the soil is neither so bare nor so dry as in Cape Colony, it is not washed away so easily.
- (3) Of course, the varied surface and latitude cause variety of climate. The coast-strip is distinctly unhealthy, especially in Tongaland, and has a very even temperature ; the uplands are perfectly healthy, and have snow and ice.

5. The products and occupations vary with the soil and the climate.

- (1) The coast-lands have semi-tropical climate and vegetation, and are generally richly charged with organic matter in the form of decayed vegetation ; this helps to keep the soil moist, to assimilate plant-food from the air, and to add to this food by generating carbonic acid.
- (2) These conditions are inimical to Europeans ; but the plants which they suit, *e.g.* maize, sugar, and tea, are such as necessitate the use of cheap coloured labour. And, as the Zulus are too proud and the Kaffirs too lazy to work, coolies are imported ; but wide planting of eucalyptus is greatly improving the climate for Europeans, and the natives do keep cattle.
- (3) The 'Midlands' contain a wide stretch of rich loamy soil from Greyton to Richmond, which is adapted for mixed farming. Horses and cattle are raised in large numbers, and are quite free from the lung diseases which affect them on the sugar plantations, and which necessitate the use of mules there ; the soil is damp enough for maize, especially round Pietermaritzburg, and the climate is dry enough for wheat.

- (4) The 'Uplands' are naturally most suited to sheep and goats, the goats thriving on the rougher land and requiring the less attention. The climate is, however, not suited to the natives; and, therefore, the mohair trade is—unlike the cattle trade—entirely in the hands of Europeans.
- (5) These Uplands are, however, most important for the coal which is found in their palaeozoic formation. The most valuable mines are on the upper waters of the Buffalo basin, especially at Newcastle and Dundee.

N.B.—The Buffalo basin also contains the historic sites of Majuba Hill, Rorke's Drift, and Isandhlana.

6. The chief commercial centres are, therefore, on the coast, while the chief political centres are on the first terrace.

- (1) Besides the port of Durban, Isipingo and Verulam are sugar centres, Stanger and Port Durnford are interested in the tea-planting along the Lower Tugela, and villages are springing up round the fertile shores of Lake St. Lucia.
- (2) Besides the political capital of Pietermaritzburg, Ulundi is the old capital of Zululand, and Ekowe is the residence of the Chief Magistrate.
- (3) Ladysmith is the junction for the Free State and Transvaal traffic, and the commercial centre of the mining district.

7. Basutoland is a high plain about twice the size of Yorkshire, and produces the best wheat in Africa.

- (1) The reasons for this are that the soil is naturally fertile, especially round Maseru; the country is very well watered by the Caledon and the Orange rivers; and the height of the Draken-Berge entirely keep off the summer storms from the sea.

AFRICAN ISLANDS.

Lesson 34. Madagascar.

1. Madagascar is not only much the largest of the African islands, but also one of the largest islands in the whole world.

- (1) It is nearly three times the size of Great Britain, and—excluding Greenland—is surpassed in area only by New Guinea and Borneo.
- (2) The Mozambique Channel is 250 miles wide, and reaches a depth of 1600 fathoms; and, as the island has several species of plant and animal peculiar to itself, *e.g.* the Traveller's Tree and the Lemur, it must have been separated from the mainland at a very distant date.
- (3) At the same time, the much greater oceanic depths beyond the island and elsewhere round the Continent, and the general structure of the island itself, prove that it must have been once united to the mainland; and the Comoro Islands supply a link.

2. Its structure is typically African, and reproduces the characteristic features of the Great Eastern Plateau.

- (1) It consists, generally, of a high plateau, surrounded by a low coastal plain; and the plateau is of old granite formation broken by volcanic peaks, while the plain is of new sedimentary formation.
- (2) The plateau rises towards the east, and then falls abruptly in terraces to a very narrow plain; while on the west it falls gradually to a much wider plain.
- (3) The water-parting runs north and south for about 1000 miles, and is marked by a line of extinct volcanoes, attaining, in Ankaratra, a height of nearly 10,000 feet; and, as it is so much nearer the east coast than the

west, all the longest rivers, *e.g.* the Ikopa, Mangoka, and Ongulaki, flow westward.

- (4) To the west of this water-parting there is a deep parallel valley enclosed by steep cliffs of horizontal sedimentary rock; and amongst the most important group of volcanoes there are large lakes, *e.g.* Itasy and Alaotra.
- (5) The granite plateau is generally covered with grassy savannahs or park-land, while the coastal plain and the escarpment of the plateau are densely forested.

3. The climate varies with the height and with exposure to the S.E. Trade-winds.

- (1) The height of the plateau and the protection of the water-parting make the climate of the interior temperate and healthy; trees are rare, and sheep and cattle flourish.
- (2) As the east coast-lands face the S.E. Trades, they have a very hot, damp, deadly climate, which suits sugar and cotton admirably, *e.g.* between Makanoro and Tamatave; and the coral formation along the shore produces splendid pine-apples. Sugar also flourishes in the Comoro islands, especially in Mazotte.

N.B.—The French are planting eucalyptus round Tamatave to improve the climate.

- (3) The forested eastern escarpment, with its heavy tropical rains and abundance of iron in the soil, is an ideal site for coffee and tea; and the forest, generally, produces rubber, ebony, and gum-copal.
- (4) In the south the island falls within the belt of the Capricorn Calms, and is comparatively barren; it is also comparatively healthy, even on the lower levels, *e.g.* south of the native centre of Fianarantsoa.
- (5) Outside the plateau and the forested region, agriculture is the universal occupation, rice and maize being the chief crops; and it is mainly carried on by tribes of Negro extraction, who are greatly despised by the Hovas of the plateau—a yellow Malayan people.

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4. The mineral wealth includes copper, sulphur, galena, and gold, as well as an abundance of iron.

- (1) This accounts for the skill of the people in metal work, especially in gold and silver ; and such skill implies the existence of the metals in considerable abundance, though mining is still undeveloped.

5. The towns are mainly ports, and all the good ports are in the north.

- (1) The reason for this is that the coasts of the southern part of the island, like so much of the African coast, are singularly unbroken ; but in the north there are several fine harbours, the finest being the land-locked bay of Diego Suarez.
- (2) The chief port at present is Tamatave, as most of the trade is done with the Mascarenhas ; but Mojanga, with its 60 miles of navigation up the Ikopa, is rising in importance.
- (3) The French still keep Antananarivo as the capital ; but its site—high up amongst inaccessible peaks on the head waters of the Ikopa—is more appropriate to the capital of the Hovas than to that of a European power.

Lesson 35. North Atlantic Islands.

1. These islands, especially the Azores and the Canaries, were of great importance in the early days of geographical exploration.

- (1) They afforded ports of shelter, they supplied fresh water and food, and they tempted the explorers seaward.

2. The Canaries were known to the Greeks as 'the Fortunate Islands,' and they certainly are fortunate in scenery and climate.



- (1) They are mountainous volcanic islands, rising to about 6400 feet in Gran Canaria, 7700 in Palma, and 12,200 in Teneriffe; and their nearness to the mainland is marked not only by their dry climate, but also by such a typical African plant as the euphorbia.
- (2) Their lofty peaks make them famous for goats, their warm volcanic slopes grow splendid grapes, their coast-lands grow early potatoes and tomatoes for the London market, and the cochineal insect flourishes on the euphorbias and various kinds of cactus in the dry eastern islands.
- (3) Santa Cruz, the seat of the Spanish Government, is on the largest island, Teneriffe, which is nearly four times the size of the Isle of Man; but Gran Canaria contains the important coaling-station of Las Palmas. Ferro, as the most westerly land in the Old World, was used for a long time as the site of longitude 0°.

N.B.—The islands take their name from the number of wild dogs (Latin, *canis*) which were originally found in them.

3. The Cape Verde Islands are of little commercial importance, but have a fine harbour and convenient coaling-station on the barren island of St. Vincent.

- (1) Their latitude and the nearness of the Sahara cause them to suffer from drought, though they rise to a height of nearly 9000 feet in Fogo and Santiago. The latter island contains the political capital of Villa da Praia.

4. As Madeira does not rise above 6000 feet, and is much farther out to sea than the Canaries, it was not discovered till much later.

- (1) Its dry air and volcanic soil produce splendid grapes and other fruit; and its mild climate attracts invalids, especially to the chief town of Funchal on the sheltered, sunny south coast.

- (2) This influx of visitors led to a great industry in embroidery and wicker goods, and thousands of pounds' worth are exported annually; but the chief exports are 'Madeira' wine and fruit, and cork dust for the latter is easily imported from Lisbon.

N.B.—Cork dust is the best material for packing grapes in because it is very light, it has no taste or smell, and it does not transmit the moisture of any broken grapes. Cf. p. 92.

- (3) The word *Madeira* is Portuguese, and means 'forested'; it was given to the island because of the mass of timber with which it was originally covered.

5. The Azores, like Madeira, belong to Portugal, and are so far from Africa that they ought not to be called African islands at all.

- (1) They are rugged and mountainous, the mountains of Flores being considerably more than 9000 feet. They are typical fruit islands, with a mild even climate and fertile volcanic soil; and their chief exports are oranges and pine-apples, the oranges coming mainly from the island of St. Michael.

Lesson 36. Mascarene and South Atlantic Islands.

1. Réunion, Mauritius, and its dependencies of the Seychelles and Rodriguez, are the highest points of a submarine bank.

- (1) Mauritius is a coral-girt, well-wooded area of volcanic hills, about three times the size of the Isle of Man, in the path of frequent cyclones; and it has, therefore, a heavy rainfall, and is an ideal site for sugar. All its towns are ports, and distil rum—Savanna, Mahebourg, Grand River, and the capital of Port Louis; Curepipe, on the water-parting of the Black River Hills, which run due north and south through the middle of the island, is a sanatorium during the summer rains.

(2) Réunion is rather larger and considerably higher than Mauritius, rising in Piton des Neiges to 10,000 feet, and it has a very active volcano in Piton de Fournaise; but it is otherwise very similar. Like Mauritius, it grows various tropical products, including coffee, aloes (for fibre), and vanilla; but, as in Mauritius, the staple is sugar. The great height and the deep gorges of the interior compel each coast-land to export its own product, though there is a railway along the coast; St. Denis is the capital, and St. Paul and St. Pierre serve respectively the west and south coasts.

(3) The Seychelles are a very beautiful archipelago, the home of the double coco-de-mer, which supplies their export of oil and copra. On the largest island, Mahé, vanilla is now being widely grown, and is exported from Port Victoria. Like the neighbouring coral group of the Amirante, the Seychelles have a delightful, if not very healthy, climate.

2. Ascension, St. Helena, and Tristan da Cunha are the peaks of solitary submarine volcanoes.

(1) Tristan da Cunha and Ascension rise from the submarine ridge which divides the South Atlantic into an east and a west basin; but, while Ascension, like St. Helena, is not 3000 feet high, Tristan da Cunha is more than 8000.

(2) Ascension is so devoid of water, that it is practically barren; but it is noted for its turtles, which support a 'tortoise-shell' industry; and its little port of Georgetown is used as a naval depot for the British West African squadron.

(3) St. Helena is well within the area of the S.E. Trades, and has plenty of rain; but reckless destruction of timber has partly caused and greatly helped the washing away of soil by the rain, so that large areas are practically barren. The chief crop—as in Tristan da Cunha—is potatoes, and the chief industry is

fishing. Jamestown, the capital, on the leeward—*i.e.* north-west—coast, is a coaling-station.

3. There are four volcanic islands of considerable importance in the Gulf of Guinea—Fernando Po, Annobon, Prince's Island, and St. Thomas.

- (1) The first two belong to Spain, and the last two to Portugal. The largest and highest is Fernando Po, which rises to a height of 10,000 feet; the next in size, St. Thomas, is not more than 7000. The soil is fertile, and the moist, hot, even climate produces all kinds of tropical plants. The chief towns are Santa Isabel on Fernando Po, and Cidade on St. Thomas.

PROBLEM PAPER.

1. Discuss the probable history of Africa if the peninsula had been in the north and the continental part in the south.
2. Illustrate the connection between race and occupation, and the connection of both with elevation.
3. What difference would it make to Africa if the Equator was where the North Tropic is?
4. Estimate the effect of planting large strips round the edge of the Sahara with trees.
5. Why, and how, will the distribution of population probably be altered by the wide planting of Eucalyptus?
6. Discuss the suitability of Africa for industries that demand local supplies of coloured labour.
7. Illustrate the circumstances which determine the position, growth, and characteristic industries of an important town.
8. Estimate the effect of flooding the El Juf area of the Sahara from the headwaters of the Niger.
9. What physical features may aid the development of Africa in the future which have hindered it hitherto?
10. How have geographical conditions favoured the growth of debased forms of religion in Africa?
11. What difference would it have made if Madagascar had been situated (in the same latitude) 250 miles *west* of Africa?
12. Compare the political and commercial value of the various European 'spheres of influence.'

AREA OF PRINCIPAL COUNTRIES.

Abyssinia,	about	150,000 square miles	= 3 England.
Algeria,	„	310,000 „	= 2 Sweden.
Cape Colony,	„	220,000 „	= 2 Italy.
Congo Free State,	„	900,000 „	= 2 Peru.
Egypt,	„	400,000 „	= 2 France.
Madagascar,	„	230,000 „	} rather larger than Germany.
Marocco,	„	220,000 „	
Orange Free State,	„	50,000 „	= England.
Sahara,	„	1,700,000 „	= Argentine.
Sudan,	„	2,000,000 „	= European Russia.
Transvaal,	„	130,000 „	= 2 Turkey.
Tunisia,	„	50,000 „	= 2 Greece.

N.B.—United Kingdom = about 120,000 square miles.

POPULATION OF CHIEF TOWNS.

Cairo, . . .	about	520,000	. . .	= Rio Janeiro.
Alexandria, . . .	„	320,000	. . .	= Kioto.
Fez, . . .	}	140,000	{ .	= Ahmadabad.
Marocco, . . .				= Bagdad.
Tunis, . . .	„	130,000	. . .	= Colombo.
Johannesburg, . . .	}	100,000	{ .	= Batavia.
Antananarivo, . . .				= Kurachi.
Algiers, . . .	}	85,000	{ .	= Saigon.
Cape Town, . . .				= Geneva.
Oran, . . .	„	75,000	. . .	= Adrianople.
Port Said, . . .	}	40,000	{ .	= Jerusalem.
Durban, . . .				= Halifax, N.S.
Zanzibar, . . .	}	30,000	{ .	= Honolulu.
Freetown, . . .				= Panama.
Tangier, . . .				= Perth.
Tripoli, . . .				= Herat.
Kimberley, . . .	„	10,000	. . .	= Winnipeg.
Pretoria, . . .	„		. . .	= Stroud.

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Abbreviations: c. = cape, g. = gulf, i. = island, l. = lake, m. = mountain, r. = river.

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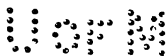
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